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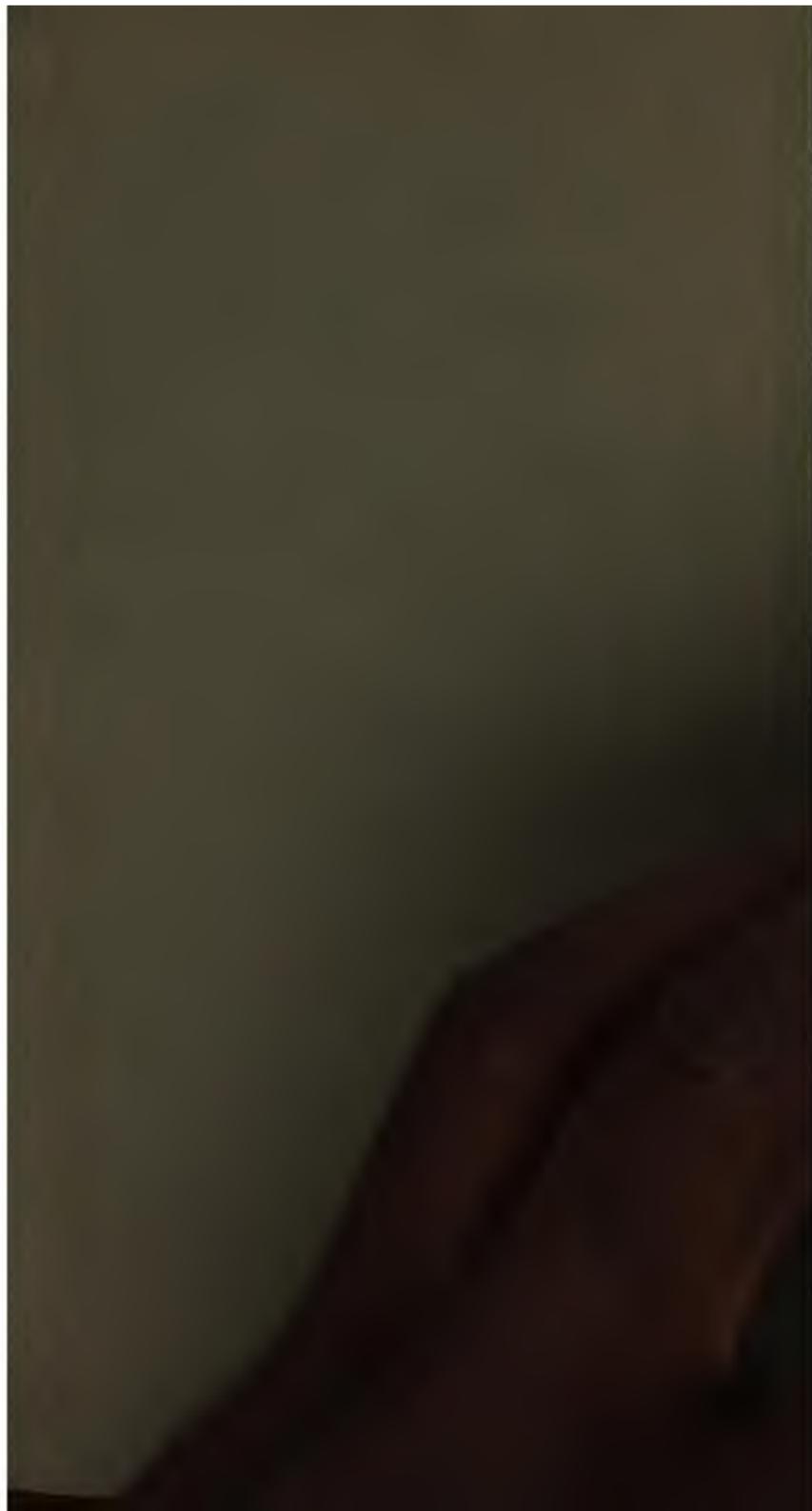
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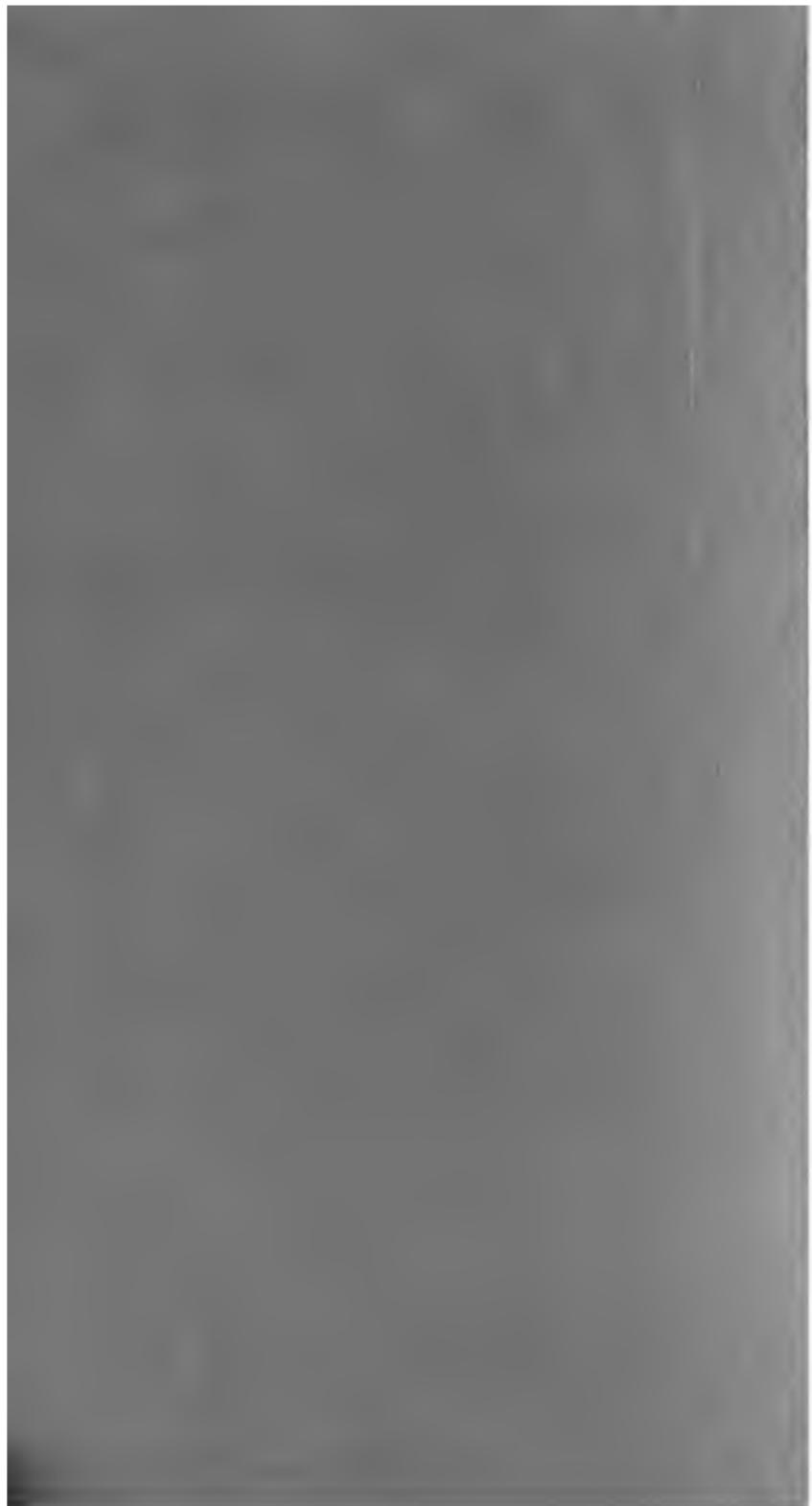
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From the Author:

With sentiments
of deep & grateful respect

J. R.



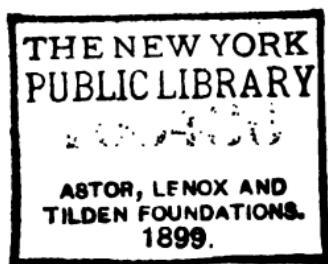
INFLUENCE
OF
PHYSICAL RESEARCH
ON
MENTAL PHILOSOPHY.

BEING THE ESSAY WHICH GAINED
THE EDINBURGH UNIVERSITY PRIZE,
PROPOSED TO THE STUDENTS OF SESSIONS 1836-7, AND 1837-8.

BY JAMES BELL,
STUDENT OF DIVINITY.

EDINBURGH:
ADAM AND CHARLES BLACK;
LONGMAN AND CO. LONDON;
AND J. ANDERSON, J. JOHNSTON, J. M'KIE, AND
J. SINCLAIR, DUMFRIES.

MDCCCXXXIX.



Cet empire qu'il faut conserver sur tout son être, exige un concours de circonstances, qui ne sont pas nécessaires à l'étude des sciences physiques, et que l'étude des sciences physiques est loin de nous pouvoir donner.—DEGERANDO.

True is it: Nature hides
Her treasures less and less. Man now presides
In power, where once he trembled in his weakness :
Knowledge advances with gigantic strides ;—
But what see'st thou, bright star, of pure and wise—
More than in humbler times blessed human story !

WORDSWORTH.

TO THE MOST NOBLE
JOHN MARQUESS OF QUEENSBERRY,
BARON DOUGLAS OF HAWICK AND TIBBERIS,
LORD LIEUTENANT OF DUMFRIES-SHIRE,
&c. &c. &c.
THE FOLLOWING
UNIVERSITY PRIZE ESSAY,
IS,
WITH EVERY SENTIMENT
OF PROFOUND AND GRATEFUL REGARD,
DEDICATED
BY
THE AUTHOR.



P R E F A C E.

FOR several years past, the Students attending the University of Edinburgh, prompted by a laudable zeal for inspiring and cherishing that emulation which is so eminently conducive to the successful acquisition of knowledge, and the full expansion of the mental powers, have come forward of themselves to supply the deficiency of means that otherwise exist for this purpose, by offering a Prize of their own. The competition for this Prize,* the Committee have always left open to the whole Students of the University : the subject connected with it, they have endeavoured from time to time to render as intermediate as possible between the different Faculties : and the task of decision they have, with a steady regard to justice and impartiality, assigned to the Senatus Academicus. The scheme, accordingly, founded upon such principles, could not fail to acquire a general interest amongst the Students ; and in order, if possible, to enhance it the more, by calling forth fresh energy in the writers, and satis-

* With a single exception, there has hitherto been only *one* Prize proposed.

fying *all* with respect to the nature and merits of that which they supported in common, a resolution was passed at a General Meeting in January 1838 —That, in future, the successful Composition should be published. Under the force of this resolution, and at the request of his fellow-students when the following Essay was publicly read, the Author now submits it to the world, however little its own intrinsic merits may fit it for that tribunal.

Excepting a few alterations, which more obviously suggested themselves after the decision of the Prize, the present Essay is in all other respects the same as when submitted to the Senatus Academicus, and crowned with their award. The Author is well aware, indeed, that the merits of his performance may seem to many unworthy of the honourable distinction and of the handsome reward which it has obtained; but he rests satisfied that, in appealing to the candour of the intelligent reader, and to the indulgence of the public, those imperfections will be greatly overlooked, which were inseparable from the manifold avocations in which it was composed; and also those proofs of juvenility (if he may so speak) which might have accompanied it, even if written under more favourable circumstances.

THE following Documents explain the terms upon which the UNIVERSITY PRIZE, awarded to the present Essay, was proposed : and exhibit, at the same time, the decision of the Senatus Academicus, with respect to the several Compositions which were then submitted to their judgment.

STUDENT'S PRIZE.

The Committee have to intimate, that a PRIZE of FIFTY POUNDS will be given for the best Essay on the *Influence of Physical Research on Mental Philosophy*.

The competition is open to all Students who have matriculated in the College or the Theological Albums, either during the Session 1836-7, or 1837-8 ; and the Essays, with sealed notes, containing the name and address of the Author, are to be given in to Mr. Small, at the College Library, on or before the 15th of November next.

April 6th, 1838.

The above intimation appeared publicly (it will be seen) on April 6th, 1838; and on March 13th, 1839, the Author of the present Essay received the following communication from the Convener of the Students' Committee :—

3, *Heriot Row, 13th March, 1839.*

DEAR SIR,

The following is part of an Extract from the Minutes of the Senatus Academicus, dated 8th March, 1839; which was placed in my hands by Mr. Small.

The Committee on the Students' Prize gave in their Report, and stated that the Essay of which the mottoes are, 'Cet empire,' &c. from Degerando, and 'True is it: Nature hides,' &c. from Wordsworth, is the best of the eight given in; which, upon opening the sealed billet, was found to be the composition of James Bell, Student of Divinity. The Senate agreed that the Prize Essay should be publicly read on Saturday the 16th instant, at two o'Clock.

Allow me to congratulate you on the honourable distinction of gaining this Prize; and believe me

Yours very sincerely,

THOS. CLEGHORN,
Convenor of Committee.

JAMES BELL,
Student of Divinity.

ARGUMENT.

INTRODUCTION.—DIVISION OF THE SUBJECT.

I.—Influences of physics upon the *nature* and *character* of mental philosophy.

General view of the tendencies of natural study,—Instanced in astronomy—In mechanics—In medicine and chemistry—Habits or modes of inquiry thus imparted to mental student, exhibited—Presumptive inferences regarding extent and character of these influences,—universal in one case—*injurious* in other—Reaction by mental science—How far to be assumed as necessary; and, therefore, as also modifying preceding remarks—Induction of Bacon considered—Not peculiar to physical investigation—Nature and effects in reference to mental philosophy—Foregoing influences derived from personal communication of inquirer with subject of study—May be termed, in consequence, *primary* or *immediate*.

Particular view of tendencies of natural study—Arise from prevailing taste and character of the age—May, therefore, be denominated *secondary* or *contingent*—Aided by effects of language—Language a powerful accessory mean of physical influences—Illustrations from *eeses* of Hobbes—Of Horne Tooke—Of Descartes—Of Malebranche—These indirect and combined influences prejudicial not less than those more immediate, noticed above—Nature and tendencies of these instanced,

(§ 1.) In systems of *psychology* and *metaphysics*—Existing nomenclature—Origin of confusion of intelligence with mechanism which it exhibits—Explained—Epicurus—Hobbes—Leibnitz—Confusion of thought with sense—Locke—Diderot—Helvetius—Hartley—Darwin—Cabanis—Effects—Scepticism as well as materialism—Hume—Collier—Norris—Berkeley—Connexion between these effects, natural and accounted for—Producing phrenology and idealism respectively—England—Germany—Kant.

Modes of physical inquiry influencing those of intellectual—Mental analysis—Instanced—In Bacon—In Newton—In Hartley—In Condillac and others—Extreme simplification—Examples and reflections.

(§ 2.) These influences further instanced in systems of *moral philosophy*—Existing nomenclature—Necessity (as it were) of external nature introduced into ethical systems and disquisitions—By D'Alembert—By Hartley—By Hobbes—Illustrations and remarks—Neglect of inductive inquiry herein apparent—Systems of ethics characterized by mathematical science—Hartley instanced, and others—Systems making sentiment the standard of virtue—As Hutcheson's—Systems making reason to form or concur in our most important moral determinations—As that of Clarke—Of Cudworth—Of Wollaston, and others.

Remarks on physical influences in respect to the nature and character of mental philosophy concluded, with review of their *beneficial* or less frequent and peculiar tendencies—Modes of physical investigation impart perspicuity, precision, and regard to inductive inquiry—These advantages manifest and successively developed in mental disquisitions of Plato—Of Pythagoras—Of

Descartes—Of Malebranche—Of Hobbes—Of Locke—Of Reid—Of Stewart—Modern mental systems considered, and illustrating these effects.

II. Influences of physics upon the *cultivation* and *progress* of mental philosophy.

These effects *negative* and *positive*—Former

Consisting, 1.—In number of students that physics attract to their pursuit from general mass of intellectual labourers—Such attraction in study of physical science—In results—In consequent enthusiasm inspired—In utility—In influence exerted upon one age by philosophy of a former—Claims of mental inquiry considered in respect to similar advantages for prosecution—And modification, in consequence, of preceding remarks stated.

Consisting, 2.—In comprehensiveness of physical systems, which prevent relapse—In new-increased power of genius of mankind—Remarks—Méchanique Céleste—Rapidity with which inquirers can proceed to new discoveries—Irresistible tendency of physics to improvement—Double discoveries—Invention of printing and gunpowder—China and Europe—Of fluxions and fluents—Leibnitz and Newton—Chemical discoveries—Priestley and Scheele—Polarization of light—Malus and Brewster—Casual or accidental tendency of physics to progressive improvement—Explained and illustrated—Extent to which mental science shares in these claims respectively for general attention, and consequently for progress, considered.

Consisting, 3.—In the subdivision physics undergo—This confirms and extends above assigned advantages for cultivation and advancement—Institution of learned as-

sociations—Nature—Tendency—Effects—Promoted in number and efficiency, by wide and ever-widening domain of science and civilization—Existence and progressively increasing advantages, therefore, establish new and paramount claim, in addition to those already mentioned, for general attention and regard with respect to physical investigation.

Positive effects of cultivation and progress of natural inquiry—Civilization, chief result of such cultivation and progress—Enfeebles intellect, thus violating fundamental condition required by philosophy of mind for successful study—This found to be unfavourable both to character and advancement of mental science—Two important consequences arising herefrom, detailed and illustrated—Effects upon philosophy of mind specified—Concluding Observations.

INFLUENCE
OF
PHYSICAL RESEARCH,
&c.

NOTHING would require greater nicety of discernment, or a more extensive acquaintance with the history of science, and with the principles of the human mind, than to trace correctly the influences of physics upon mental study. Not only is the inquirer liable to an undue bias from the character and opinions of the age in which he lives ; but, owing to the vast compass which the sciences of mind and matter occupy in the field of human knowledge, and the consequent extent of their interference with other branches of study, there is danger, lest, while in

the one case he views the subject through a sort of distorted medium,—in the other, he assign causes altogether foreign, or attempt to reduce what is only contingent, to stable and universal principles.

While it shall be our constant endeavour, then, in the following Essay, carefully to attend to the history of science—as a requisite necessary for ascertaining, with any degree of success, those effects which the study of nature is calculated to excercise over that of mind ; we now also propose, with the same view of removing, so far as it may be possible, the difficulties that have been complained of, and of giving to our remarks their due method and precision, to regard the influences of physics under two broad and distinct aspects. For these influences, we conceive, may be referred mainly, if not entirely, both to the *spirit of inquiry*, which they who are devoted to natural pursuits are apt to imbibe and carry away from them into their mental speculations ; and to those *results*, by which the prosecution of the study of nature may likewise affect that of the science of mind. In other words, physical research will be viewed, as it operates, first, upon the *nature and character* ;

and, secondly, upon the *cultivation* and *progress* of mental philosophy.

I. We shall begin, accordingly, with a brief consideration of the physical sciences, and their general and obvious tendencies,—as introductory to a view of their more particular effects, in regard to the nature and character of mental inquiry.

Astronomy then, perhaps the most perfect of all the sciences, best illustrates the tendencies of physical research, and that spirit of inquiry which the mental student is apt to receive from its pursuit. The influences of this, like those of every other natural science, will appear very fully, if we regard, at the same time, that tone of thinking which attention to mathematics likewise produces ; for the comparative perfection of astronomy is mainly indebted to the assistance it has received from them :*

—————Nubem pellente Mathesi,
Clastra patent coeli, rerumque immobilis ordo.

* See Playfair's Dissertation in the *Encyclopædia Britannica*, init. ; also Brucker's *Hist. Crit. Phil.* tom. v. p. 625.

So intimately, indeed, have these subjects of inquiry co-operated to one grand result, and in this way, revealed so successfully the mysteries of nature, that astronomy may, with justness, be considered as a compound science; and, consequently, some of its most remarkable influences on the character of the mental student appear in the habits of research imparted by demonstration itself.—As in mathematics, therefore, the action of the intellect has aptly been compared to a spring tending in *one* direction;* so the *uniformity* of external nature, upon which, as on a ground-work sure and stedfast, researches in astronomy proceed, will always impart, in like manner, to those who are devoted to them, ideas of necessity, and still firmer anticipations than before of undisturbed succession respecting the phenomena of the mental world. Now, in a science whose details are of a character so uncertain and fugitive as those of mind, it is obvious that all attempts are misplaced to seek after necessary and invariable sequences. Uniform succession belongs exclusively to the material world. While we observe the necessary and actual manifestations of matter, we can

* Appendix, Note A.

only calculate upon the probable or potential effects of intelligence. Presuming, with entire and well-grounded confidence upon the established order of things, we see that the revolving skies (if we may borrow an example,) will bring the same appearances hereafter that they now do, and have done heretofore ; and we expect that the tree which bore its leaves in spring and its fruit in autumn, will resume the same aspect, and repeat its gifts, on the return of the same seasons. We can predict, even to a second, when the Moon shall be eclipsed ; when Jupiter will be in opposition ; or Venus pass over the disc of the Sun. Demonstrative science, and a firm confidence in nature's promises of undeviating uniformity, by thus supplying the exact rules of operation in the laws and phenomena of the material universe, render such inferences at once possible and easy to us. But we cannot affirm, in like manner, what mind will do in any given case ; although we may possess the intellectual implements required, and be furnished with the materials for exercising them. The effects which *it* produces are entirely optional. Nature is governed by firm and unchangeable laws ; but it is the prerogative of mind to act from choice, or even from caprice :

Know God and Nature only are the same ;
 In man the judgment shoots at flying game,—
 A bird of passage, gone as soon as found,—
 Now in the Moon perhaps, now under ground.*

Inasmuch, therefore, as it is the acknowledged tendency of mathematical pursuits not to aid, nor even to admit the unfettered operation of any of the intellectual faculties, excepting those only which are indispensable for themselves, as has repeatedly been proved ;† and as such tendency may be assumed, from the extent to which we have noticed demonstrative reasonings to co-operate with the science now under review, and, independently of its own inherent character in this respect, thus to become the property of *it* likewise ;—so we may conclude that, by devoted attention to astronomy, the main condition of success in mental researches, which is the full and unrestrained development of all the powers of the mind, will thus inevitably be perverted. It is a remark, coeval with the speculations of the Stagirite, and abundantly confirmed by sub-

* Pope's Moral Essays, Ep. I.

† See, for example, an article in the Edinburgh Review, (Vol. Ixii.) which completely establishes this point ; and which is distinguished by profound thought and extensive erudition.

sequent history, that the capacity of receiving knowledge is necessarily dependent for its formation and character upon the previous and accustomed habits of the recipient mind. When these habits then are, in the present instance, such as we have described them, we are to expect, in general, a limitation of intellectual ability, and an incapacity for sound investigation, in the student who turns from researches in astronomy, with which he has, from long and devoted attention, become familiar, to the consideration and pursuit of mental philosophy. This limitation and incapacity will be more correctly seen in the contradictory qualities of *credulity* and of *scepticism* which they engender in the inquirer; and which, because they are great intellectual infirmities,* are, therefore, also prime obstacles to success in the study of mind, and calculated to deteriorate its character.

1. *Credulity* of mind is the necessary consequence of cherishing admiration and belief only in an order of necessity and nature, which mathematics and astronomy have already appeared to have a direct and immediate tendency to produce; and of the liability of the inquirer being forced, when he ventures beyond his own

* Appendix, Note B.

sphere of study, and has occasion to feel the incompatibility of his familiar principles of investigation with mental researches, to accept his facts with regard to them on authority merely, or upon imagination. How mis-shapen and unsubstantial, therefore, must those theories necessarily be of the philosophy of mind, which are moulded from materials so imperfect and corrupted ! The speculations of Pythagoras and of Leibnitz may be instanced as emphatic testimonies to the accuracy of the view now exhibited, of the effects of astronomical inquiry upon the philosophy of the human mind ;* speculations which, but for the infirmity which we are observing this branch of physical science to produce, might have rivalled the more cautious and correct, though not more ingenious and profound researches of Locke and Reid.

2. The tendency of exclusive attention to pursuits in astronomy to induce a habit of *scepticism* upon the philosophical character of the mental student, also admits of easy illustration. Such minds as have long and intensely been habituated to investigations carried on by demonstrative reasoning, when applying themselves to men-

* See Coleridge's estimate even of Newton's genius ; Table Talk, vol. i. p. 217.

tal philosophy, not only endeavour to introduce the spirit of this reasoning into a subject where mathematical certainty is inadmissible; but come likewise, in the end, to repudiate as unreal, what in their new and unaccustomed task, and guided by their former principles of evidence, they now find themselves unable to verify. An ignorance of the one science, (which, from previous inattention to mental subjects, there is every reason to believe exists in inquirers like these,) and an extensive and intimate acquaintance with the other, conspire to disqualify them for successful progress in the former, and to render their exertions in it ineffectual and fallacious. And for the truth of these observations, appeal might be made (if we may apply the language of Warburton,) to those wonderful conclusions, which inquirers such as the present, acting under similar influences, have arrived at, when attempting to write on subjects not susceptible of the rigid certainty of their own favourite studies;—but the thing is notorious.

From this imperfect survey of the tendency, and of some of the effects of astronomical study, we shall now turn to the consideration of other branches of physical research: having dwelt

thus largely upon the former, in the meantime, because of *its* influences, we apprehend, a precise description would be equally and justly applicable to *all* the natural sciences, when brought to the same stages of perfection, and partaking, in consequence, of the same degrees of mathematical certainty. Then, also, would the inquirer be obliged to forego the full and harmonious for the partial or one-sided development of his faculties ; and thus he would receive at the same time an incapacity, as it were, for the successful prosecution of a science whose chief or essential condition this species of development does any thing but fulfil. But without assuming such departments of natural inquiry as *Mechanics, Medicine, Chemistry*, or the like, as having yet attained to, or even as at all destined to reach, an equal state of perfection with astronomy, let us now inquire, in the same cursory way, what effects the study of these is calculated, in their present condition, more particularly to exert.

With respect to the first of these branches of science, so far at least as we may regard the mathematical character or portion of it, similar influences on the habits of the mental student may

be predicated, we think, to those which, in general, have been ascribed already to pursuits in astronomy. There are *two* distinct methods, it is allowed, in which mechanical inquiries may be conducted : the first, by means of mathematical reasoning, founded upon principles which induction has enabled us to establish ; the second, by assistance derived from experiments.* Nearly then, if not precisely upon the same principle, that like causes are followed by like results, may mechanics, so far as they are conducted mainly by the former of these methods, naturally be expected to give rise to effects on the philosophical character of the mental student, essentially the same with those which astronomy (where the application of mathematical reasoning has been so successful) was shewn to produce. But with regard, on the other hand, to the study of mechanics, as carried on by the latter of the modes of investigation which were specified, it may be observed, that, as a natural consequence, those minds which have been habituated to *experimental* inquiries, to mechanical *realities*, will, upon attention to the nature and operations of their

* Young's Lectures on Natural Philosophy, vol. i. p. 253.

own powers, constantly mix up the material with the immaterial, and thus vitiate the character of their mental speculations. Such inquirers as these in the field of mental science, must always be discovering, in their new occupation, the same palpable attributes which they found in the old ; and the all-important distinction between spirit and matter they will persist in treating with fresh and still more confirmed neglect, till they give rise at last (which has too frequently happened) to the most noxious and deformed productions in the philosophy of mind.

And by combining the character of materialism, as thus obtained from a view of the *experimental* and *palpable* with the *mathematical* or *necessary*, as formerly noticed, in the science of mechanics, we may now compute their average effect on those who are devoted to these pursuits, as consisting, perhaps, in the tendency which such students will have, when engaged in mental researches, to take into account only mere possibilities ; or at least to omit, in their reasonings about mind, certain dispositions of thoughts and things, which, while they are neither necessary nor ideal, like demonstrative subjects, nor so real and tangible as experimental, assume, notwithstanding, a multiplicity and minuteness

of character, that almost elude observation. In the system of mechanics, therefore, it will be seen that there is no scope for the operation of those finer powers and springs, whose unfettered action, in all attempts carefully to estimate the nature of mind, is to be assumed as an essential postulate. They may furnish an instrument to cut the Gordian knot of mental philosophy, but not a clue to the unravelling of its varied intertexture.

Shall we apply, then, to the sciences of *Medecine* or of *Chemistry*, with better grounded anticipations for the healthful influences which we are in quest of? Is their pursuit calculated, above that of astronomy or of mechanics, to effect sound and vigorous results with regard to the nature and character of mental science? So far indeed is this from being the case, that, in *one* view which may be taken of them, and in which perhaps they most frequently present themselves, they will be seen in a light most obnoxious to clear and correct inquiries concerning mind. For, so far as the knowledge of the physician, for example, may be regarded as a "dead stock," or as facts and data merely, which, we may mention, do not imply in their possession the full development of the intellectual powers; the phi-

losophy of mind is doomed to be material in his hands, no less than in those of the student of experimental mechanics. "It can scarcely be expected," says Roger Bacon, with much truth, "that an excellent physician, whose fancy is always fraught with the material drugs that he prescribeth his apothecary to compound his medicines of, and whose hands are inured to the cutting up, and eyes to the inspection of anatomi-zed bodies, should easily and with success flie his thoughts at so towering a game as a pure intellect, a separated and unbodied soul."* This feat, if possible indeed, is by no means likely; all his attempts to perform it having a direct and a necessary tendency to adulterate the na-ture of mental science, and to render it "of earth earthy." Since he has learned so much already from touching and handling, and possibly himself witnessed of late the face of all chemical and most of physical knowledge changed, in con-sequence of the convulsions excited in the limbs of a dead frog, he will still torture and experi-ment, and be administering perpetually to the sores himself inflicts, "the smoke and tarnish of the furnace!"

If, in the *second* place, however, we regard

* Appendix, Note C.

that discrimination and sagacity which the complicated and fugitive phenomena of disease require in the observer, no other studies will appear better preparation than those of medicine and chemistry for ingenious and profitable disquisitions concerning mind. Of the four great mental inquirers — Descartes, Malebranche, Leibnitz, and Locke—the last alone had the benefit of such training ; and, therefore, in the words of Condillac, “ how greatly is he superior to the other three !” In fact, even since his time, many of the most valuable contributions to our mental science, it is well known, have been made by individuals eminent for their medical and chemical attainments.

But besides these distinct and opposite tendencies in the study of the sciences now under review, there is produced, by a sort of mutual composition as it were, an intermediate result, which, in their present stages of improvement, we may state as their natural and accustomed influences. We shall now, it may be true, never witness that “ bulky foundation of matter,” as it has been termed, “ which disqualifies so essentially for abstracted metaphysical speculations ;” we may never observe the effects of those “ no-

tions," either, "which continually flie in the subtle air;" nevertheless, it is obvious that, by the love of extreme analysis to which the study of medicine and of chemistry incites, but which, in the conceptions of the inquirer, is, how minute and infinitesimal soever, necessarily associated with something palpable and material, he will be inclined to cherish, notwithstanding, a sort of elective affinity for the atomic and the unprofitable in his mental speculations. His station, if we may so speak, in the pure region which he now inherits, and whose atmosphere he breathes, will be found intermediate "between the earth and heaven." It can scarcely be expected, therefore, that, even while engaged in this new and unaccustomed task, his labours will meet with full and unfettered encouragement; or that he will be freed entirely from hindrances at once unfavourable to the successful prosecution of his study, and requiring to be struggled against, "not without injury and distress:"

—Like a bird that breaks
Through a strong net, and mounts upon the wind,
Though with her plumes impaired.*

* Wordsworth's Traveller, B. ix.

Such, then, being a summary and imperfect view of the more prominent divisions of physical science, and of the influences which they are calculated, by means of the spirit of inquiry which they create, to exert upon the nature of mental philosophy ; what are the general conclusions that are now forced upon our attention : what are we now authorized to infer with regard, for example, to the *extent* and the *character* of the influences in question ?

1. The reality of some specific influence, imparted by physics to the mental student, as manifested in our review of the more comprehensive branches of them, is deducible directly, we may observe, from what will universally be admitted with respect to the nature of the human mind, namely, that if habituated to certain kinds of thought, it cannot at once divest itself of them ; but when passing to the consideration of other objects, conjures up ideas concerning these analogous to those already imbibed by custom. Now, if this be true with respect to the influences of the more *important*, it would seem to hold likewise regarding those of the *subordinate* branches of physical research ; in virtue, we may add, of a law similar to that by which, when the tide flows strong in the main sea, (if we may employ a metaphor,) there can be no doubt

but it will also, in due time, fill every channel, creek, and harbour. In other words, the extent of the influences of natural inquiry may be predicated as *universal*, upon the nature and character of mental philosophy, inasmuch as these are also communicated (more or less) by *all* its departments.

2. Assuming again such reality and extent as we have described in the influences before us, and premising (to which, we believe, no one will object) that every science has a *genius*, if not *methods of inquiry*, which are peculiar to itself, it seems obvious, in like manner, with respect to the *nature* of these influences, that they are, upon the whole, *injurious*; and that they are manifested in this character and tendency wherever their existence is recognized. While this inference will abundantly be confirmed in the sequel, it also frequently accompanies, we may observe, the avowal, by different writers, of the very reality which we have ascribed to the influences of physical research. Thus we not only find those causes enumerated to which has been owing the subjection of the character of mental science to the effects of natural investigation, but are likewise assured, that the greatest boon which the former could

receive, would be by contracting the power, or even arresting the encroachments of the latter upon a domain where its jurisdiction is questionable; and thus to impart to it a proper genius and language, so as to promote its improvement by an independent cultivation of its own.*

Are we to conclude, then, that the influences of physical research, while they are *universal* upon, are also *invariably injurious* to the nature and character of mental science? Or that when once the former reaches a certain stage of progressive improvement, it then creates a reaction, by which its effects on the latter, instead of being obnoxious as before, now assume a tendency which is entirely beneficial? It became the first office, indeed, of mental science, under the management of Socrates, even at a period of high pretensions to physical knowledge, to call down philosophy from the "airy sublimation" in which it roamed, thereby to counteract the prejudicial sway which the study of nature was then but too apparently exercising upon that of mind. And when natural philosophy has been cultivated, and has attained to an extent which

* Degerando, *Des Signes*, tom. iv. c. 10; and Stewart's *Elements*, vol. i. p. 50.

its most sanguine admirers in the preceding century themselves never hoped to realize, it has been asserted, that "to the faculties of the understanding, which are the instruments with which we operate, whether in mental or in material research, there must be some beneficial subordination of the latter; because these faculties, when correctly ascertained and attended to, enable the physical inquirer to speculate, and even to invent with more system and with greater certainty of success." *

But, with reference to this observation, it occurs to mention, that since the mind employs for the production of new results in natural inquiry, the known laws of thought as well as of matter, a knowledge of it is *desirable* for the former, in common indeed with *all* the sciences, though not *essential*, however, to the prosecution of any but that of itself. The understanding may, without an intimate acquaintance with itself, be successfully exerted, we conceive, upon all other departments of knowledge. It may know every thing, and yet be ignorant with re-

* Dr. Thomas Brown's second Lecture. Brucker (Hist. Crit. Phil.) makes somewhere the same remark, which, in like manner, appears to us erroneous.

spect to the nature of its own operations. The faculty by which the astronomer calculates the disturbing forces that operate on a satellite of Jupiter in its revolution round the primary planet, may, so far as its nature and constitution are regarded, be as entirely unknown to him as the materiel or construction of the telescope through which he merely performs his observations ; because a given effect may depend upon a particular object as its cause, and yet by no means imply our acquaintance with the nature of that object. To carry on our inquiries in the study of nature, no reflex view of our own minds is necessary for attaining even to the most successful results. As the bee, without the aid of the fluxional calculus, makes the top and bottom of his cell of three planes meeting in a point, where the angles are those found out by the geometer to be the best possible for saving wax and work ; so the student of nature, in his turn, from observation and experiment, or manual operation only, deduces his law of equilibrium, for example, or of accumulated motion ; and with the actual illustrations before him, obtains a familiarity with the mechanical laws, that he could never have gained, perhaps, from logical deductions.

Nor does it seem at all fatal to the character which we have now assigned to the influences of physical research upon the genius and aspect of mental philosophy, that those modes of inquiry which have been so successful in "interpreting nature," are likewise of a *beneficial* tendency when adopted and carefully acted upon in disquisitions regarding the laws and properties of mind. The application of correct methods of inquiry to natural science, has in all ages been so far in precedence of the adoption of the same in mental, as long to have attracted universal remark ;* and the Baconian induction accordingly, which was only the emancipation of the human mind from the errors in which it had previously been implicated, has claimed an intimate relation to physics, and here been of so signal service, as often to have been deemed peculiar to this department of knowledge. In compliance, therefore, with the common conceptions upon the subject, we may be warranted occasionally to limit in meaning the *inductive* process of inquiry, so far as to ascribe its beneficial influences upon the character of mental

* Appendix, Note D.

science to physical investigation itself ; without receding, however, from the general conclusions at which we have already arrived. The inductive logic, strictly speaking, is of universal application, and not confined to any particular department of knowledge.* Thoughts and feelings, indeed, it may be impossible to treat with a menstruum, or to get rid of opinions, or even prejudices, by any known process of dissipation ; but in mental science, notwithstanding, as in every other which proceeds on regular principles, the attention of the student is confined at first to simple views and particular facts ; and it is only upon these, when properly ascertained and classified, that he afterwards advances, by successive and connected steps, to general laws with regard to the qualities or operations of mind. Although philosophical inquiry, by means of induction, is generally associated, as we observed, with physical science, because first applied with success to this branch of knowledge ; yet it is only a mode of inference which regulates the proceedings and affairs of ordinary life, and which the human mind, by its very constitution, is prompted to make. Instead, therefore, of at-

• This is expressly intimated by Bacon himself.

tributing to the influences of natural research, when *thus* conducted, the superior character of those systems of mental science which have so fortunately superseded the "pneumatological romances" which preceded them, we might refer it more correctly, perhaps, to that general revival which was produced, of a principle of inquiry which is freely proffered as a guide to all who listen attentively to the dictates of nature.

The change, accordingly, was instantaneous and marked, which, upon the application of the inductive logic of Bacon to physics, was, through their influences, also wrought upon the nature and character of mental science. At this resuscitating inspiration, as it were, the philosophy of mind awoke in renovated and lasting beauty. Though experiments literally of the same kind with those to which matter is subjected could not, as we have said, be made with advantage upon the thinking substance, (the attempt to do so being among the prejudicial influences, as it remains to be seen, exerted upon the latter by physical research,) still it is undeniable, that others equally well adapted to the nature of mind were now, in consequence of the beneficial results of the Baconian method in the science of nature, everywhere contrived

and executed with success. Locke, for example, in our own country, trod exactly in the path which Bacon had pointed out ; and his *Essay*, accordingly, because uninfluenced by the love of hypothesis, and executed in the strict spirit of inductive inquiry, may, in opposition to those speculations in pneumatology which were prior to, and performed without the aid of this mode of investigation, be regarded and termed the first real history of thought and feeling. In France, too, Degerando, deriving his model from Bacon, suggested and compiled a comprehensive plan of logic, solid in its principles, and practical in its precepts ; and accompanying the mind in all its operations. And, in keeping with these results, is the remark of Hume, that “since men are now cured of their passion for hypotheses and systems in natural philosophy, and will hearken to no arguments but those derived from experience, it is full time that they should attempt a like reformation in all moral disquisitions, and reject every system of ethics, however subtle and ingenious, which is not founded upon fact and observation.”* So just is the connexion, conceded very properly by the same author in another place,

• *Essays*, vol. ii. p. 221.

between Bacon and those philosophers who are uniformly allowed to have put the science of mind upon a new footing.

But while the Baconian induction produced such important effects upon mental science, through its palpable benefits to physical research, the influences of the latter, (which shews that they have a natural and inherent tendency to *injure* the character of the former,) were again soon apparent in the obnoxious garb that they had worn before. Though inquirers had already been led to the acknowledgment, then almost universal, that *observation*, on the one hand, and *reflection*, on the other, were essential to just notions and successful pursuits, with regard to matter and mind respectively, yet the incursions of nature were again introduced into the domain of mind ; and the subsequent history of the latter abundantly testifies to the prejudicial character which it received anew from physical researches. The mental reasonings of Plato and Aristotle, before the *Novum Organon* appeared, were, in many instances, both more acute and more solid than those, in a period which had long succeeded them, of Leibnitz and of Priestley.

Many causes concurred to mislead the mental student from the proper path of investigation ; which, though mainly owing, as we shall see, to physical research, were likewise peculiar, no doubt, to the character of his own favourite pursuit. The seclusive habits, for example, which it forms, induced a distaste for that active observation which is indispensable to success in mental, as well as in material science ; and thus it is, perhaps, that views essentially correct have generally been as frequent regarding the former, as the carrying them into effect has been rare. Many, speculatively, have recognized principles with respect to it, which few practically have applied to regulate its constitution. Many, having had a glimpse of the truth, immediately lost sight of it. Beginning with confusion, they advanced with hesitation ; and after holding for an instant the principle which might have spread so strong a light around it, they suddenly dropped it from their hands. Though many, at various times, have thrown out important hints with respect to the advantages to mental science of a mode of inquiry analogous to that which, after Bacon, produced such beneficial effects on natural research, yet they either neglected the proper distinction between the operations of the thinking principle, for example, and material

objects ; or they stated their illustrations of the subject in a way which (to say the least) often seemed to indicate a momentary confusion of intelligence with mechanism. The meteor might have discontinued, or abated of its more dazzling influences ; but the horizon of mental science still attested them by occasional flashes, or a feebler blaze.

From these cursory remarks, then, it is to be gathered in general, (as we have already hinted,) that there are influences of an *injurious* tendency, imparted to the philosophy of mind, which are inherent in, or peculiar to, physical research, and have been exemplified subsequently, as well as prior to the period when the inductive method of inquiry was recognized ; and in consequence of which, mental science might otherwise have been improved and advanced, both in its nature and in its character.

Since, therefore, the influences of physical inquiry, strictly so called, can scarcely be regarded as possessing a *beneficial* tendency in their own nature, even when favoured with, or when conducted without, the method prescribed by Bacon (as the preceding observations would indicate) ; we shall reserve our remarks upon that tendency for a subsequent portion of this

head,—proceeding, meanwhile, to the consideration of their *detrimental* character, as it will be evinced by a more immediate reference to those effects and features which the history of mental science may be found to exhibit.

The influences of the study of nature, which we have already noticed, are comparatively obvious and simple; arising from the personal communication (so to speak) of the physical inquirer with the subject-matter of his pursuit; and may be termed *primary* or *immediate*. But, upon reviewing the actual condition of mental science, we shall have to deal with influences which may be regarded as *secondary* merely, or *contingent*; and which are both less palpable to the observer, and more difficult to unravel, because formed and diversified by those methods of research and the prevailing taste of the age, which it is peculiar to the spirit of natural investigation, in various ways, and by complicated means, to produce. These are a numerous and a powerful class of physical influences, to whose sway nearly the whole domain of mental science is more or less subjected; and their origin, however imperceptible, is, nevertheless, natural, and admitting of easy illustration. There can be no

doubt, indeed, (and a sagacious thinker of the present day has remarked,*) that the reigning philosophy of any age influences powerfully men's convictions and habits of thought: and the spirit of physical inquiry, therefore, if generally pursued, finds easy access, through modes of cultivation for example, into the subject-matter and aspect of mental science. It is in perfect keeping with this obvious and acknowledged fact, that the physical character of the philosophy of mind appears, in many instances, to have been superinduced by inquirers, often in no way distinguished for their attainments in, or for their previous devotion to, the study of nature. The element in which they now live, move, and have their being, has been infected with the colour of physical research; and their own minds and mental inquiries, accordingly, imbibe, and are characterized by a congenial hue. Like those *impressions*, or *models* of things, which, according to Democritus and his school, were continually flying off from their substances, and floating in space—the influences of material science are now disseminated

* Mr. Whewell; Pref. to Sir James Mackintosh's Dissertation, apud fin.

every where—in numberless particles, and intermingling combination :

Quæ, quasi membranæ summo de corpore rerum
Direptæ, volitant ultiro citroque per auras.*

Hence, too, it is—we may add in regard to the influences in question—that in them there is a law of transmission (so to speak) which we shall have abundant occasion to see equally powerful and conspicuous as in the animal and vegetable kingdoms; and in virtue of which the aspect of the mental speculations of a previous age is imparted to its successor, just as the distinctive properties of a particular creature or plant are likewise embodied in the generation that follows it.

The injurious influences, then, (secondary or contingent) of physical science, which we propose now more particularly to illustrate, may be regarded as remarkably powerful; both from the causes which have been seen to constitute their reality and scope, and also from that law, which we have just noticed as providing for their continuance and propagation. But the power of *words* in aiding or increasing these

* Lucretius, lib. iii.

effects, inasmuch as it is peculiar to mental science—at once intellectual and moral,*—is too important an accessory cause of physical influence to be overlooked, and may, in the meantime, be shortly adverted to, before entering farther into detail.

Language, indeed, viewed as the material machinery of the mind, is, properly speaking, a very prominent mean of physical influences, because of the corporeal imagery which it assumes, and of the associations to which, in consequence, it gives rise. “It seems best,” says Malebranche, “to illustrate our ideas of understanding and will by properties belonging to matter, which, being easily conceived, will render them more distinct and familiar.”† Thus the materialism of Hobbes was aggravated by his well known partiality for a corporeal phraseology; and likewise the character of those reveries on the union of soul and body, and upon the nature of habits, “in reading which (it has

* For the sake of distinction and convenience, (it may be remarked here,) that the term *mental*, generally or always in the sequel, is made to include psychology or metaphysics and moral philosophy—*intellectual*, to embrace psychology and metaphysics only.

† *Recherche de la Vérité*, liv. i. c. 1.

so pertinently been remarked by Harris,) that we seem to view the human mind only as a crucible, where truths are produced by a sort of logical chemistry." And even of Descartes, Malebranche, and Locke, who did so much to emancipate the " science of man" from the undue action to which it had before been subjected by natural researches, and who brought not unfrequently to its study the most careful attention, the nicest discrimination, and refined principles of inductive inquiry, the disquisitions were tinged, notwithstanding, with the colour of material investigation; and effects produced upon them for which the influences of physics merely, without the aid of language, should of themselves have been wholly incompetent. The spell of words presented to their speculations a slippery descent into the region and spirit of a material philosophy.

We may add, that when once the influences of language have been established upon the domain of mind, and have imparted a physical aspect to speculations in psychology or morals, they are prolonged by the same causes, (perpetually increasing in power,) that concurred in originating them at first, namely, the difficulty of exercising duly our own powers of reflection,

and the pleasure which the mind feels in “ being amused (as it has otherwise been expressed) with analogy and metaphor, when it would look only for the severity of logical discussion.”* Of these influences the writings of many, and particularly of Horne Tooke, afford a very remarkable example. These inquirers (and the reality and power of the influences in question are the more striking, that the legitimate province of language had previously been defined by Locke,) professed *by words*—as media of investigation—to explain the nature and operations of mind; instead of directing the attention carefully to that internal world, of which the phenomena can be properly understood only by the rigid exercise of our own powers of reflection.

The influence of words upon the character of mental researches might have been anticipated as injurious, inasmuch as language, when viewed as the instrument of thought, besides assuming a corporeal imagery, and originating, in consequence, material associations, is inadequate to the various occasions and exigencies of mind. So generally has this remark been acknowledged and reiterated, that inquirers have long since

* Stewart’s Dissertation in Encyc. Brit.

despaired of those sciences, which depend upon language as their only means of expression, ever reaching a permanent and an indisputable state. Its prejudicial influences were subjects of complaint even with the father of the inductive logic, as interfering with the due exercise of that mode of investigation which he established, and designed as applicable to all departments of philosophical inquiry. "Credunt homines," he observes, "rationem suam verbis imperare: sed fit etiam ut verba vim suam super rationem retorqueant." To this we may append the remark in the present day, of a distinguished disciple of Bacon, (although by it we are not led to affirm that the influence of words over our ideas is absolute,) that "since language is the instrument of thought, when once a particular meaning has been affixed to certain terms, this meaning will tend still to adhere to our minds, and we will continue to use the expression, even though it be manifest that another or even that a contrary sense should be attached to it." Such influences, we may add, of language upon the character of mental science, proceed upon the same principle to which are to be ascribed those abuses, that, under the cover of a mere name, or with the

sanction of by-gone ages, have been perpetuated in society ; and those opinions and prejudices, in like manner, which men have in all periods and countries employed for the destruction of existing customs and institutions.

In a word,—language is a very important accessory cause of physical influences upon the nature of mental study, in the injurious aspect in which we are viewing them ; because, in common with those *indirect* effects of natural science with which we have seen it to co-operate, it has at once a real origin in material inquiry itself, and a powerful claim in its own character for continuance and propagation.

The influences, then, which we have described above, and regarded as secondary merely or contingent, in contradistinction to those effects which are more obvious and simple, and arising from the personal communication of the inquirer with physical science, have, like them, been also viewed as *injurious* in general, and noticed as applicable, in this character, both to intellectual and to moral research. Although both of these departments, indeed, of mental science, might now be illustrated at once, in reference to the character which the physical influences in question have produced and are calculated to give

rise to, yet, since some effects are peculiar to the one, and others to the other, they may be exhibited with most advantage by adopting the two divisions alluded to ; and beginning, in the first place, with

(§ 1.) *Psychology and Metaphysics*.—Of the influences which we are now to illustrate, the nature may, in some measure, be anticipated from the nomenclature of intellectual science. As the body is susceptible of motion and figure, so the mind, according to Malebranche, is capable of ideas and dispositions. He regarded the first as its figure ; the other as its motions. The atomists represented the mind as a *tabula rasa*, which, like wax, receives impressions and ideas communicated to it from without. Hobbes defined perception to be the apparition produced upon the brain by motion ; and Hartley's *vibratiuncles* only mean the images which the sense of an object leaves behind it. Locke asserted the mind to be white paper, and the two inlets of knowledge to be sensation and reflection. Reflection upon the train of thoughts continually passing through the mind, furnished, in the conception of that writer, the idea of succession, the

interval between any of its parts being duration: whence he defines time to be merely the interval between two thoughts. "It is natural," remarks Necker in allusion to these views, "to compare the intellectual faculties to those little balls (for example) that fly out of their niches — to strike our brain, which, by its various ramifications, produces a certain shock that impels our will." "In all this," he continues, (and that is what we wish particularly to refer to,) "we only discover puerile figures, put in the place of those terms, that indicate at least, by their abstraction, the indefinite extent, and the important nature of the ideas which they represent."*

The confusion of intelligence with materialism and sense, so palpably evinced in the samples which we have now given from the nomenclature of intellectual science, originated, we may remark, in a manner at once obvious and simple. Since, for example, one of the earliest ideas which we have of that very familiar existence,

* Religious Opinions, pp. 191, 192. (English Translation, Edin. 1789.)

body, is its capacity to communicate motion by impulse, so we are naturally led to associate with some physical agency our notion of our own minds, which we do not acquire to any extent, until our familiarity with the objects of the external world has, in some degree, materialized them ; and which implies, in like manner, the production of motion by thought. Accordingly, “ wherever there is motion there is thought,” was a maxim laid down by the first philosopher of Greece ; and the different theories of causation, both in ancient and in modern times, sufficiently evince the reality and character of the influences referred to. Matter and mind were thus viewed as possessing in common the attribute of efficient agency ; but, by an obvious analogy, the former alone, since it afforded the chief and most palpable scene of succession, led inquirers to associate with it their ideas of force or of power.

In this way it was that the intellectual nature of man came to be blended with, and subjected to, his physical. Hobbes, after Epicurus, confounded the distinction between mind and matter ; and to his doctrine of necessity, in which he was followed by Hume, he supposed that mankind would agree, because they expect a con-

stant uniformity in human conduct; such love of uniformity having been inspired in his mind, perhaps, by the professed attempts which he made to transfer into his intellectual researches the spirit of physical and demonstrative science; and which he imagined he had successfully done by the mode in which, from the given principles, he deduced his system of materialism. And the *monads* of Leibnitz, equally with the necessity of Hobbes or of Hume, illustrate the same physical influences. He, too, confounds together thought and extension, inertia and activity. Connecting, by the tie of an invincible necessity, the First Great Cause with the fabric of the universe, he reduces Him merely to the level of the moving-spring of a vast machine; a confusion, (it has justly been observed,) that prevented truth from advancing, and rendered absurdity the inevitable consequence.*

But the nomenclature which was instanced of intellectual science, evinces the subjection of the character of mind, by those who speculated upon it, to *sense*, no less than, as we have seen, to the *stricter necessity* produced by habits of devotion

* In reference to this subject, see Scott's Inquiry into the Nature of Causation, pp. 144, 145.

to material study. The reduction, by Locke, of the capacities of receiving knowledge to sensation and reflection, especially if we consider the vast influence which his writings exercised upon other inquirers, went far to effect the consequences which we refer to ; not to mention the confirmation which so high an authority gave to similar views that had prevailed before, respecting mind. From his principles Diderot supposed that every idea, when brought to its ultimate state of decomposition, must necessarily resolve itself into a sensible representation or picture.* The same physical character might be instanced in the disquisitions of Buffon, Helvetius, and others, respecting mind ; who—as disciples, too, of Hartley, Darwin, and Cabanis—ascribed so much to bodily organization, with regard to the intellectual powers.

Nowhere is the neglect of the inductive method, and the consequences of such neglect more palpably manifested, than in that portion of Locke's Essay from which these physical apprehensions, with respect to mind, may be said mainly to have originated. There was neglect of it, in attempting to reduce all the inlets of knowledge

* *Œuvres*, tom. vi.

to sensation and reflection, thus educating our information from too scanty materials; and the consequences were,—the rejection of all truths which could not be referred to these two sources: in a word, the philosophy of Locke was thus handed over to the doubts of Hume, and, perhaps also, to the idealism of Kant. Upon the assumed maxim, for example, that nothing really exists, but what may be traced to the senses; the idea of causation, the soul, Deity, and universe, alike, because unable to furnish this patent for their being, were discarded as mere chimeras, interfering with the dictates of true philosophy, and retarding the real business of life.* And Berkeley, Kant, and his school in Germany, though professedly opposing the scepticism of Hume, themselves narrow too much the basis for the material world; and their systems, while marked with the activity of subtle intellect, are yet deficient in the reality of objective existence. They approach the very confines of that land, which it is the main object of their pursuit to avoid, far less to enter upon.

The opposite dispositions to materialism and

* See Douglas' (of Cavers) *Philosophy of the Mind*, which contains many sound remarks upon some of the most distinguished theories and systems that have appeared regarding it.

scepticism, *both* in relation to the same objects, and also in the same individuals, have often attracted notice. In the *first* place, we may observe, that from the same source of physical influences,—from the writings of Descartes, Locke, or Malebranche, the material theories originated, on the one hand,—of Hartley, Darwin, Condillac, and Helvetius, respecting mind; and on the other, of Hume, Colier, Norris, and Berkeley,—who laid so little stress upon the intimations of sense with regard to the existence of the external world. And while these examples show that materialism and scepticism may both obtain respecting the same objects, it may be stated, in the *second* place, to exhibit their reality likewise, in reference to the same individuals, that Hobbes, though notorious for his materialism, was frequently a sceptic in his metaphysics; that Hume, though proverbial for his scepticism, was a materialist, notwithstanding, in his doctrine of impressions, and in his description of belief, memory, and imagination; as was also Kant, perhaps, so far as his speculations are to be regarded, concerning the points, for instance, the forms, and the limits of the intellect.

Corresponding, again, to those intellectual in-

quirers, of whom Germany has been the seat of so many, and who, in their zeal against materialism, scarcely recognise the existence of anything but of mind, are those in our own country, in particular, who regulate their researches by the structure and conditions of the brain. The idealist is allied to the sceptic ; and the phrenologist leans upon materialism ; each having his philosophical character moulded alike, and deformed by the influences of physical investigation. In both we find that inductive logic contemned or overlooked, which is pursued by the faithful disciples of Bacon or of Newton. And the phrenologist, as he makes the faculties of the mind to depend upon, instead of being illustrated merely by reference to organic action, or as he regulates their activity and power by the quantity of the elastic fluid they are combined with, we may properly characterize, in the language of Vesalius, as “a would-be Prometheus, and a forger upon the greatest impress of the Divinity.” *

The tendency to belief in the doctrines of

* Vesal. Anat. viii. 623.—In Dr. Cook’s admirable Synopsis, there are just reflections upon this subject, as also upon intellectual science generally : “ In small room large hear enclosed.”

phrenology, is natural and obvious in an age of *experimental* research. Not to mention the difficulty which exists, at all times, in the inductive study of mind, in consequence, for example, of the close attention required, the limited extent of our information, the evanescent nature of the operations and phenomena, and similar obstacles, which, however, that science, if it may be so called, professes to remove, there is much that is plausible to the inquirer, in subjecting the intellectual powers, like material substances, to actual decomposition, without which, he conceives, there can be no experimental treatment of them ; while of these powers, moreover, it is manifestly vain to attempt the explanation, without reference to organic action, or to those physical conditions, under which, from the constitution of things, all their operations must be conducted. The faculty of memory, for instance, may be considered as inclining upon the material world ; because, though not exclusively conversant with material objects, yet it rarely or never entertains any notions as part of our past history, unless in reference to things seen, heard, or felt. The residence in the mind is, indeed, possible, of pure, abstract conceptions ;

but the recollection of them is entertained only as they shall happen to be associated with circumstances of place, company, or physical sensations. And similar remarks are applicable to imagination, and other intellectual faculties.

But, besides these influences, which are opposed to the inductive method of inquiry prescribed by Bacon, we may, in passing, instance others that are induced, in a great measure, by *modes of investigation* proposed to be experimental, but which confound the proper distinction between mind and matter, which it is a main object of the Baconian logic strictly to discern and adhere to.

The present illustration, then, of the influences of physics upon the nature of intellectual science, we may conclude by instancing the action of those modes of inquiry merely, whose employment in such researches was most direct and natural. We have said that, in mental analysis, men are apt, if long and intensely habituated to physical investigation, to suppose that there can be no treatment of *its* powers, unless they be subjected to actual and visible decomposition.

Sensations they will decompose with crucibles, and divide perceptions with prisms. They will believe (for physicians have indeed supposed,*) that nature, elaborating the elastic fluid in the brain, by means which escape our observation, thereby disposes it to put certain parts in motion, without interfering with the harmony of others, and accordingly gives rise to sensation, thought, and volition. Bacon himself was not free altogether from this prejudice; but assumes, on some occasions, the existence of *animal spirits* as the medium of communication between soul and body. Newton, in like manner, speaks of a universally-pervading ether, by whose vibrations and impulses he conceives it possible to render a solution at once of the phenomena of gravitation and of sensation as excited in the brain by external pressure. Their example has been imitated, with too strict precision, by many intellectual analysts; who, for instance, have reduced thought into a collision of subtle fluids, indefinitely small, and explained all the faculties of the mind by matter as an ultimate fact. Of these remarks, ample illus-

* See Becquerel's *Relations of Natural Philosophy with Chemistry, &c.* in the *Bibliothèque Universelle de Genève*; *May, 1837.*

trations occur in the writings of Hartley, Darwin, Locke, Condillac, and many others, whose extreme attachment to *experimental* inquiry violated the conditions of that truly inductive method, without careful attention to which all mental analysis is vain, and every system, however brilliant or ingenious, only flimsy tinsel or unprofitable research.

Such *physical* analysis of mind engenders in the inquirer a disposition to extreme simplification; so much so that, from attempts at the latter Hartley and Condillac, for example, passed directly to the threshold of *materialism*. Metaphysical alchemists, like the students in chemistry, repudiate every system of mind which admits of more than one explanatory principle; and the result of their boasted simplicity, corresponds with the futility of the data upon which it proceeds. Because every thing of which we are conscious, (except only our sensations,) for instance, is an *idea*; and as every kind of connexion among our thoughts may be termed *association*, so all the phenomena of mind, forsooth, have been affirmed in one of these systems, as being cases of the *association of ideas*! To such systems, then, characterized in the manner which has been described, we may

apply the simile of Wordsworth, and liken them to

A pillar of smoke,
That with majestic energy from earth
Rises ; but having reached the thinner air,
Melts and dissolves, and is no longer seen.

It is not meant by these observations to deprecate the rigid analysis of the mental powers ; but merely to notice the evils to which such analysis gives rise, when conducted by spurious methods, or purely by modes of physical inquiry. From the earliest times, the sciences in general, but more especially that of the human mind, have been vitiated by an undue love of simplicity. Men have not been sufficiently satisfied with knowing, that in the operations of mind as well as in those of bodies, certain things are, without being able to discover how they are so. Reflection, so necessary to mental analysis, involves, for example, the deliberate exercise of attention, recollection, and comparison ; processes to which the bulk of mankind, and even of intellectual inquirers, seldom subject their thoughts with due care : while the beauty of a science, on the other hand, increases in proportion to the simplicity of its *data*, compared with the variety of consequences which they embrace.

And with these considerations in view, and regarding as now coinciding in their impulse the dislike which accompanies what is next to impossible, and the attraction inherent in what ought frequently to be forbidden, our surprise is rather that physical research, merely through the channel before us, should not have exerted more than so little prejudice upon intellectual science.

(§ 2.) With statements and reasonings too, in *moral philosophy*, with the finer sensibilities of our nature, our hopes and fears, our joys and griefs, our antipathies and predilections, with the affections that bind us to each other, and the passions that modify or cement our social intercourse; physics are as essentially incompatible as with the purely intellectual part of our nature.* Let us now shortly view their prejudicial influences upon ethical science, as exhibited in the nomenclature which it has received from them.

Some ancient inquirers, as the Platonists and Peripatetics, assigned a certain space to each of

* Mackintosh; *Dissert. in Encyc. Brit.*

the moral principles and desires ; and the point where all centered without collision, was the mediocrity in which they placed virtue ; which they regarded as the harmony of the whole soul. Hartley, in like manner, supposed that between the natural and moral world there was a close analogy ; and that as the former subsided into shape from original chaos, so the rule of life, drawn from the practice and opinions of mankind, subsides and improves itself perpetually, till at last it declares for virtue, and excludes all kinds and degrees of vice.* In accordance with these views, it is observed by Hume, that “ in contrary passions, if the objects be totally different, the passions are like two opposite liquors in different bottles, which have no influence upon each other ; but if the objects be intimately connected, the passions are like an alkali and an acid, which, being mingled together, destroy each other. If the relation, on the other hand,” he continues, “ be more imperfect, and consist in the contradictory views of the same object, the passions are like oil and vinegar, which, mingled, never unite and incorporate.”† Gassendi, too, explained virtue by rules drawn from

* *Observations on Man*, vol. ii. p. 207.

† *Essays*, vol. ii. p. 183

mechanical science. And Malebranche affirmed that all our inclinations extend in an even direction, and could have no other end but the attainment of happiness and truth, if no foreign causes diverted them to sinister purposes ; just as all movements would be in straight lines, if no external influences changed them into curves.* Clarke, we may add, the disciple of Newton, used to say, that a wicked action were as absurd as to take away the properties of a figure. But while it is pleasing to employ such phraseology,—or to call a *motive* a moving ball ; and *uncertainty* and *repentance*, for example, the combat of two of these balls, till the intervention of a third forms a determination ; and to say that the concurrence of many such balls towards the same point, excites in us an impetuous passion ; yet who does not see that, (in the language of a great author,†) after having endeavoured to debase the functions of the mind by these wretched comparisons, the difficulty remains undiminished ?

Our subsequent illustrations on this subject, will refer to the nature and character of some

* Recherche, liv. i. c. i.

† As quoted in p. 42.

of the more distinguished moral systems and authors, in which such nomenclature as we have described prevails.

The stern *necessity* of nature has been applied to many of the most remarkable speculations that have existed with respect to moral science. The views of the origin of *justice*, as given by D'Alembert,* and of moral regard and disapprobation, by many other inquirers, afford striking testimony to the truth of the observation which has been made. Hartley and his followers regarded the moral principle as the result of mere force, or physical constraint; in addition to which, nothing more was conceived necessary to render love, esteem, or reverence to the Deity, or to a parent, more binding or sacred than physical or any other control.† This theory likewise was made to account for the great diversity which has obtained in the sentiments of mankind, respecting the objects of their moral obligation; and to shew why, upon the common and less consistent supposition of the independence of the principle of virtue upon the

* *Oeuvres*, tom. i. ii. pp. 182, 183, and pp. 235, 236.

† Preface to *Obs. on Man*; and see *Encyc. Brit.* Article, *Metaphysics*.

laws of the natural constitution, *it* should not be as invariable and uniform as the perception of colour or sounds, or, above all, as the judgments of mathematical or physical truths.

But of such influences as we are describing, the character of Hobbes, as a moral inquirer, suggests the most appropriate example. That writer, accustomed, in early life, to long and intimate conversation with the most eminent astronomers, and skilled, besides, in geometrical investigation, "so destructive," according to Gibbon, "of the finer sentiments and feelings of moral evidence, which must, however, determine the actions and opinions of our lives,"* (such being the prevalent effects of physical science in his time,) contracted, in consequence, an apathy for the cross-bearings and multiform transactions of society, which induced, in its turn, a mode of thinking that terminated in an entire distaste for free and unrestrained discussion, and in an abjuration of moral rights in man altogether. Hence it is, perhaps, that the ethics of Hobbes encourage licentiousness; it being the character of his *speculations* only, and not his *practice*, that was infected with the colour of the physical influences around him.

* Life of Gibbon, p. 66.

Inattention to these facts, it may be presumed, has led to the common opinion, that the ethics of Hobbes were made entirely for his political system. It is not intended to question the truth of this opinion as a general rule; for Bacon is just, we conceive, in making the practical science of *politics* to regulate, in an essential degree, the colour and fashion of all moral researches. In like manner, too, it is the well-grounded belief of Mackintosh, that every account of moral science is incomplete, which is not combined with that of political opinion—the link which, however unobserved, always unites the most abstruse of ethical disquisitions, with the feelings and affairs of men. Locke, accordingly, gives to his narrative the colour of the time; and every part of his ethics has a reference, more or less palpable, to the circumstances of his age; without perceiving which, it is impossible to seize their spirit, or estimate their merit. All this is readily conceded; what we insist upon at present merely is, that the importance of such facts, however great, ought not to throw out of view the influences upon writers like Hobbes, and upon systems similar to his, of those branches of study with which we have now more especially to do.

The nature and general character of such moral systems as have now been noticed, may be considered as having been essentially produced by premature generalizations, and an undue neglect of the method of inductive inquiry prescribed by Bacon, and adopted by his followers. For example, it has been affirmed by authors who were much devoted to medical science, respecting the nature of virtue, that the moral practice of man, like the phenomena of animal existence, results entirely from mechanism, and their ideas of vice and merit; that of happiness, the end towards which all aim, the desire and knowledge take their rise from organic sources; and, that although, according to this view of the subject, the identity (or at least the similarity) of animal structure in *all*, might be expected to lead directly to certain determinate objects,—the great aberrations and discrepancies, however, which mankind evince in their conduct, instead of *impugning* the received system, are only so many difficulties that remain to be *reconciled* to it! This, then, equally with Locke's account of the inlets of knowledge, is a clear instance of narrow and imperfect induction; and presents the same obstacles to a full and accurate system of ethical, as the former to one of intellectual science.

But the most remarkable method, perhaps, in which physical inquiry has influenced the character of moral science, consists in the adoption of mathematical forms and terms ; a fashion which was prevalent in England during a large portion of the last century. The ambition of demonstrative certainty in matters concerning which it is not given to man to reach, was a frailty from which even the professed disciples of Bacon or of Newton were not exempt ; but to which they were naturally tempted, (if not by the occasional example of their masters,) by the physical investigations around them. With sanguine anticipation a period was looked forward to, when future generations should put all kinds of evidence into mathematical forms ; reducing Aristotle's ten categories, for instance, and Wilkin's forty *summa genera*, to the head of quantity alone,—so as to make natural, medical, and moral philosophy coincide, *omni ex parte*.*

Conformably to these anticipations have systems of ethical science been distinguished ; both those which make *sentiment*, and those which affirm *reason* to concur in most of our moral determinations. The moral merit of an agent

* Hartley on Man. See also Appendix, Note E.

is proportional, according to Hutcheson, to a fraction, having the moment of good for the numerator, and the ability of the agent for the denominator ; that is, (as he explains it,) the moment of good produced by an individual, depending partly on his benevolence and partly on his ability, is appropriately expressed by saying that the first is in the compound proportion of the two others. Many similar instances, which it is needless to enlarge upon, might be adduced from the same author ; of which, though they were intended, no doubt, as *illustrations* of his general reasonings, not as *media of investigation*, the obvious tendency is to vitiate the character of ethical researches, by confounding, as they are thus made to do, the evidence of different branches of knowledge. “ The application of geometry to moral subjects, (we are informed in a paper occasioned by these views,) if discreetly used, may be so far useful by pleasing the imagination, and illustrating what is already known ; but until our affections and appetites shall themselves be reduced to quantity, and exact measures of their various degrees assigned, we shall only ring changes upon words, without advancing one step in our inquiries.” *

* Lond. Phil. Trans. pp. 512, 513.

To the same influences, as we hinted, together with the love of simplicity, may be ascribed, in an essential degree, much of the character of Clarke's speculations on moral science ; and also, perhaps, of those of Cudworth, Woollaston, and others. There we observe an explanation of the virtuous and vicious principles by certain moral relations, in the same way (we are told) as are discovered the truths of geometry and algebra ; the relation, for example, which subsists between good-will and good-offices in one person, and then ill-will and ill-offices in another, being, according to the disciple of Newton, that of contrariety. But make reason alone the standard of right ; extinguish all the warm feelings and prepossessions in favour of virtue, and all disgust and aversion to vice ; and morality is no longer a practical study, nor has any tendency to regulate our lives and actions. In this way the pure gold of truth has been adulterated by the spurious keys with which inquirers have, at different periods, attempted to unlock her treasures ; and her ultimate acquisition retarded, in consequence of the time and labour spent in restoring her nature to its original purity and refinement.

It only remains, in reference to this part of our subject, to view the influences more properly *beneficial*, which physical science may be found to exert upon the nature and character of mental philosophy. For *its* effects, like the inundations of the Nile, are to be considered, after all, as (figuratively) productive of the vine as well as of the weed.

Although, in treating of the *injurious* influences of physical researches, which, strictly speaking, it is their more peculiar tendency to impart, we, indeed, saw the spirit of demonstrative reasoning to be unfavourable to the philosophy of mind ; yet there are instances in which, when employed within proper bounds, it may be regarded not only as innocent or indifferent, but even as advantageous to that study. When viewed in this light, it is to be assumed as counteracting the tendency of mental speculations to over-refinement and subtlety, as turning to practical use distinctions of abstract points in researches concerning mind, and as fixing our generalizations, by imposing precise terms. The advantages of the exact sciences, (and, therefore, *so far*, those of physical inquiry also,) are conspicuous, for example, in the aerial philoso-

phy of Plato, into which their spirit was largely infused ; and to them, too, the ontology of Pythagoras owed its success ; as we may observe in his speculations regarding Deity, duration, and infinity, of which it is the opinion of Locke that number gives the clearest idea.*

The advantages of physical investigation are chiefly remarkable indeed in the clearness, unity, and precision which it imparts to systems of mental philosophy. Descartes and Malebranche, for instance, from attachment (so often professed) to modes of natural research, transfused into their writings a perspicuity and an order uncommon before their time in disquisitions on mind ; and thus, however faulty in other respects, they were free from mistakes that might have been incurred, if they had employed a different or a more technical and abstruse phraseology. The mental system of Hobbes, owing to his admiration of Euclid's style, was (in the language of Mackintosh) transparent, exactly proportioned, and majestic. Locke, too, often redeems confused and contradictory notions by a style precise and perspicuous, affording, through these

* *Human Understanding*, b. ii. c. 17. § 9.—Compare Brucker's character of Tschirnhausen, as formed from the same causes ; *Hist. Crit. Phil. tom. v. p. 599.*

effects of physical investigation, a striking contrast to Kant; to whose mind, uninfluenced as it was by such means, obscurity and perplexity seem to have been natural, and to have obtained too ready an access into the mental disquisitions of his followers.

These happy effects, combined with a strict attention to inductive research, are especially remarkable in the late investigations which have taken place (particularly in our own country) respecting mind, and in the cautious and correct mode of mental analysis. *Our* modern inquirers, careful in adopting general principles, averse to what is vague or obscure, or to whatever cannot be clearly expressed, and rendering theory the simple expression of facts, have employed this delicate art with wonderful success. Of sound mental analysis, Hume's inquiry into the principle of moral approbation has been considered as a perfect example, equalled only by the cautious yet accurate investigations of Reid. The advantages of physical science in regard to the character of this author's researches, are peculiarly remarkable. Directing reflection with great skill and attention, he added to patient and profound thought a nervous and a lucid style; which was destined to be rendered still more intelligible

and inviting by the clear apprehension and charming eloquence of a distinguished disciple. Stewart, besides other essential contributions to mental science, has collected the scattered lights, afforded by preceding inquirers upon the subject; and in *his* hands they shine with a concentrated and a vigorous effulgence, and will shed their splendour over the horizon of the present into another age. Thus much may be said regarding the *beneficial* effects of physical investigation upon many of our modern systems, which, characterized, as we have seen them to be, by beauty of expression, *together* with profoundness of thought, remind one, by their fine solidity, of the stately monuments of ancient Egypt—wrought in granite, and destined for eternal duration.*

Such then is a summary review, and perhaps imperfect illustration of the effects, injurious and

* We might here notice also the character of those observations on mental science which occur in Addison, Fontenelle, and especially in Vauvenargues and Duclos,—which character might be found owing greatly to the influences in question; but as brevity is one of our main objects, we have deemed it proper to abstain from any remarks upon incidental writers, as it were upon mind, limiting ourselves, here, only to systematic or formal inquirers upon the subject.

favourable, direct and mediate, of natural researches upon the nature and character of mental philosophy. And although they may have presented themselves to our notice most repeatedly in their prejudicial character, so much so that this alone, strictly speaking, it may appear to be their real or inherent tendency to produce, yet we do not mean to deny that the contrary may possibly be the aspect which, after long perversion, they may be destined to assume. We have spoken mainly of course, and hazarded our conclusions, from the instances of the operation of natural study which its history exhibits ; and while from these data we might be justified, perhaps, in regarding the spirit which it induces as *permanently* injurious to the character of mental science, we are still willing to anticipate for the latter a final and a lasting emancipation, procured by the influences of the former, in virtue of that law of progressive improvement in human affairs, which has ordained that the reign of error and of prejudice shall only be finite. The veil may become withdrawn at last, in consequence of the very obscurity which it has induced ; and the character of mental philosophy irradiated by increased effulgence. This anticipation is countenanced by numberless instances

afforded by a review of the history of the world, which render it extremely doubtful indeed whether mankind have suffered more from the agency of error, or gained by its efficiency in dispelling the clouds of intellectual darkness and perversion. It required, for example, that Popish corruption should accumulate for a thousand years, that those energies might be excited which led to the Reformation ; nor was it till a period had elapsed of profoundest intellectual slumber, that, at the inspiration of Bacon, and the efforts of his followers, the philosophy of mind awoke from its long dormant and torpid condition, with renewed vigour and activity. Without darkness, Nature's brightest objects could never have been revealed.

But the final prospects of mental science we shall be able more properly to observe and appreciate, after having reviewed the influences of physics upon its *cultivation* and *progress*, a subject to which we must now hasten to advert.

II. Upon the influences, we may now observe in the second place, which attention to physical researches have already appeared to induce respecting mental philosophy, may be supposed

principally to depend their effects upon its pursuit and advancement. No branch of knowledge, as we have remarked, can be successfully attended to, which obtains not a free cultivation of its own ; and, therefore, since the progress of physics must confirm and diffuse their own spirit and character, they will necessarily oppose a barrier of corresponding strength to the onward march of the philosophy of mind. But leaving this view of the subject for our concluding reflections, we shall proceed, meanwhile, to the consideration of the more important of those inherent tendencies in physical research, to arrest or retard the career of its less imposing rival.

1. And our *first* observation is, that whatever tends to divert those minds which will generally be engaged in *some* pursuits, to the prosecution of any *particular* intellectual study, furthers the improvement and progress of the latter, to the prejudice, or at the expense of the successful cultivation and advancement of the other classes embraced under the former, and consequently also of mental philosophy ; and that, because of inducements which are peculiar to themselves, natural researches alone, it would

almost appear, possess this tendency. And these inducements we shall now briefly advert to and illustrate.

In studying astronomy, for instance, (and a similar remark may be extended to *all* the natural sciences,) there is a delight felt by every one to trace the unexpected resemblances and relations of things ; to follow with our own eyes, as it were, the marvellous works of the great Architect of nature ; and observe the unbounded power and exquisite skill which are exhibited in the most minute, as well as in the mightiest parts of His system. Of such objects the contemplation satisfies our natural curiosity, imparting some of the highest and holiest pleasures of which we are susceptible.* Thus, Kepler (in the words of a biographer) could not have been bribed into an acceptance of the Electorate of Saxony, in exchange for the glory of his discoveries ; having been one of those authors who esteemed a production of genius above a kingdom.† And in the same sense, it has truly and

* See Mrs. Somerville's beautiful eulogy ; *Mechanism of the Heavens*, Prel. Dissert. ; also *Library of Useful Knowledge*, Prel. Dissert.

† *König. Biblioth.* p. 444, voce *Keplerus*.

beautifully been said, that “ the intellect of Newton or of Galileo took a sublimer flight than the fancy of Milton and Ariosto.”

But, while the *study* of physical science affords satisfaction which is exquisite, attractive, and permanent, its *discoveries* also are astonishing, perspicuous, and arresting universal attention ; like the light of the sun, their effect being immediate and irresistible. On looking at them, we cannot but feel how noble and elevating must be the pleasure derived from acquiring a mastery over the powers of nature, which enables man, weak and finite as he is, to wield at will her wondrous works ; to use the globe which he inhabits, for example, as a base whereby to measure the magnitude and distance of the sun and planets, and make the diameter of the earth’s orbit the first step of a scale by which he may ascend to the starry firmament. And in keeping with what has now been said, it appears from history, that the discovery of new truths in natural science has always excited public attention, and not unfrequently absorbed it. The researches of Galileo, and of the Florentine academicians, might be instanced, as well as the splendid discoveries of Newton, which at

once arrested the attention, and monopolized, (if we may so speak,) the intellectual spirit of their respective nations and ages.

To all which, it may be added, that there is an *enthusiasm* inspired by physical discoveries, which burns the warmer as it encounters external opposition, ignorance, bigotry, or restraints of any kind ; and which stimulates inquirers more eagerly to diffuse, and enables them to be more successful in attaining yet farther the objects of their pursuit. While political convulsions agitated the world, earth also unfolded the tale of her revolutions through the remains which were buried in her bosom. The rugged ridges of the Pyrenees, as the British artillery flashed upon their summits, and the secrets of material composition yielded (in the brilliant language of modern history,*) to the persevering efforts of scientific analysis. There was excited by the captivating spirit of physical discoveries, an ardour of inquiry which the storms of revolutionary France were incompetent to extinguish ; an array of successful invention which the armies of the Allied Sovereigns were unable to subdue :

* Mr. Alison's History of the French Revolution ; Introduction.

Quos neque Tydides, nec Larissæus Achilles,
Non anni domuere decem, non mille carinæ.*

And to the same unconquerable enthusiasm and ceaseless energy it is owing, that many truths and discoveries, once derided even in men of original genius, have already at once been recognized and are at this moment admitted as elementary principles in the reasonings of ordinary people: every day extending their empire and multiplying their progeny. Galileo quailed under the thunders of the Pope, only that the celestial physics might be cultivated with a success unknown till then; and obtain willing votaries and increased influence in the day of their power.

But it remains to be seen how far the advantages hitherto specified, as belonging to physical research for general cultivation and progress, are common likewise to mental science; and, consequently, how far our *first* remark is liable, at the same time, to objection or modification.

Of mental science, indeed, the influence of

* Virg. *Æn.* ii.

any new system may form the general character of the times ; it may engross the public mind, and be seen as that which is most worthy of attention ; yet, (not to insist upon the attribute of *utility*, immediately to be noticed, which combines so powerfully with the other characteristics and claims for general prosecution which were ascribed to physics,) it is undeniable that such a system, at its first promulgation, does not strike the imagination with a force so great or so lasting as the researches of the natural philosopher or the chemist ; and is interesting only to a few, and not to the great majority of those who devote themselves to intellectual pursuits. While, for example, there is no great pleasure in being told that three laws of association, joined to a few original feelings, explain the whole mechanism of sense, imagination, memory, belief, and of all the actions of the mind ; or that a particular affection, which, according to the received ethics, has been regarded as selfish, should more properly be considered as social ; while all this, how attractive soever to those who may have a turn for mental disquisitions, would sound only as frigid philosophy to the general mass of students ; there is positive gratification to know, on the contrary, that the

lightning of heaven can be drawn down to the earth by means of an ordinary chain, and there collected in vessels ; that the water which we drink is composed of two gases, similar in consistence to the air we breathe ; with a thousand other facts of a like kind ; all advancing, for the study and pursuit of matter, claims of so palpable and interesting a nature over those of mind.

Not only, however, are the discoveries (if they may be so termed) of the mental philosopher less brilliant and attractive than those of the astronomer, or of the chemist, and, therefore, destitute of the same claims for general cultivation ; but, from their very nature they can be interesting, as we observed, only to a few, and not to the great mass of students. A system of physical science is aptly composed of contributions from all and sundry : every addition made to its existing facts, is equal to a great discovery ; and every individual a benefactor, if he can only rub off the rust, as it were, from the instruments with which it is prosecuted. Nor is it necessary, either, that his genius be proportioned to the importance of his contribution : this deficiency *chance* itself will often conveniently supply. But in mental philosophy the case is far otherwise. For *it* the reader would

require nearly the same qualifications with the writer ; while its systems, in order to be systems, must issue entirely from transcendent intellect, unaided by contingent advantages. The mental inquirer must outstrip, instead of obeying the genius of his age ; and his speculations, therefore, because established by the might of his own soul, are almost inevitably mis-adapted for the general comprehension, and as useless to the world as a beacon raised above the clouds. How many labourers, accordingly, in the field of mental science, have been forced to bequeath their names to posterity ; and after the sound of their genius is passed, how long has the world often been in awakening to the impulse ! The reputation of Descartes, made little or no progress during his own lifetime ; and we have also Warburton's authority for saying that Locke, while alive, had neither followers nor admirers, and hardly a single approver.*

In reference, again, to their characteristic, *utility*, we may observe that it ensures for physical science, not only its cultivation absolutely among the people, but likewise imparts to it relative advantages in this respect over mental phi-

* So we are told in one of his letters to Bishop Hurd.

losophy. The inventors of the useful arts, the Greeks admitted as the highest beings in their beautiful mythology. People soon tire, indeed, of theories which, as is the case too generally with the study of mind, are comparatively barren in any useful consequences; for "vain," it has been truly said, "is the tree of knowledge without fruit." To be of lasting and of universal pursuit, an object of intellectual attention must also be attractive and useful.

That mental science, however, is entirely destitute of utility, we scarcely mean to affirm—all the sciences being distinguished, more or less, by that palpable attribute. While history shews human beings in their various and opposite conditions in their progress and relapses, thus revealing the causes and means by which their happiness and virtue may be promoted, the philosophy of mind, too, is pregnant with the same practical instruction. Treating of the noblest and most useful objects—of man's mental condition, of the foundations of human knowledge, of intellectual and moral cultivation, and of our relation to the spiritual world—it has been said (in reference to its utility alone) to furnish the key to all other learning, just as the

hand is instrumental to all other instruments.* Natural history or philosophy may acquaint us with the laws which regulate the phenomena of the material universe; but mental inquiry also traces, in the many appearances, (to use an expression from Plato,) the one principle; and produces classification, which is the last improvement of knowledge, and the operation, which is the origin of all ability. In a word, it produces the greatest utility, because, by diminishing the number of particulars, it communicates to the human mind a new and decisive supremacy over the objects with which it has to deal.

Yet the utility of physics, it must be owned, is less refined, so to speak, and more obvious than that of mental science. *Their* truths are not theory, but they come home to men's business and bosoms with a power of appeal, which is so palpable as not to admit of being resisted. In fact, so superior is the utility of physical research to that of mental, and consequently so much more likely is it to be a subject of general attention, that the main compensation, perhaps, which the latter possesses, in respect of its being studied, arises from the danger merely which there is

* Bacon.

in the natural inquirer, of keeping the attribute in question too closely in view ; and thus, by confining a progress that should be altogether unrestrained, of modifying its influences upon the pursuit of the philosophy of mind. Physical science is always prosecuted with most success ; and, therefore, its real influences on the progress of mental study, the greatest, when it is cultivated from the mere feeling of its own excellence, and not from a sense of the utility which it affords. For there can be no greater impediment, it is allowed upon all hands, to the progressive improvement of science, than a perpetual and an anxious reference by the inquirer at every step to palpable utility. If the principle of the hydrostatic paradox, for instance, had not possessed claims all along for general admiration and attention, independently of consequences resulting from the application of it, these might never have been converted, at last by Bramah, into a valuable and a powerful engine. The instruments and methods, likewise, by which the lunar theory was brought to perfection, might still have remained unknown ; and the practical question itself concerning the longitude as yet received no solution, if mathematicians had never engaged in other speculations than those which manifest-

ly conduced to purposes of acknowledged utility. Not that the utilitarian search after physical science, however, is without its injurious influences upon the progress of the philosophy of mind, as the sequel will abundantly evince; but in certain ages, and in its more immediate tendencies, it is rather apt (by remanding the existing intellect of the age, now averse to the abuse of the real end of *all* study, namely, its own inherent pleasure, into the paths of mental investigation,) to impair its relative claims for general attention; especially since the irresistible impulse of every true inquirer in physical or in any other pursuits, is inconsistent with the persuasion, that he can have no rational inducement to research but the tangible benefit of his expected discovery. Hence it is, perhaps, that our own countrymen, who have always been prepared with the question *cui bono* in their physical inquiries, have, till of late only, not made the same progress in natural, though (from the diversion of the existing intellect of the times into channels more congenial to the real end of study,) much greater improvement in mental pursuits, than nations far less advanced in the scale of civilization, but not having their own

purpose defeated to an equal extent by their mercantile prejudices.*

These illustrations, however, of the superior claims of physical research for general attention and study, refer to their influences in a *given age* only; while the most important remark, perhaps, is, that they extend of necessity to *subsequent periods* likewise. For while the intellect and mind of a people are devoted to physical pursuits, it is impossible but a powerful influence must (according to a profound observation of Hume) be exerted, at the same time, upon the genius of the next age, and the direction which *it* is to take. Those, indeed, who cultivate the sciences with such astonishing success as to attract the admiration of posterity, must necessarily be few in all nations and ages; but it seems also to accord with facts, that the same genius and spirit which glowed in them, were antecedently diffused among the whole people, to produce, form, and cultivate, from the earliest infancy,

* Appendix, Note F.—There is, perhaps, as much truth as sarcasm in Coleridge's reflection, that our modern times "would dig up the charcoal foundations of the Temple of Ephesus to burn as fuel for a steam-engine!"

the powers of *their* minds. Newton lived in an age which was still warm with admiration of Kepler's discoveries, and merely *confirmed** the existence of those laws by which his predecessor had supposed that bodies should gravitate towards each other. And had Locke lived in the period of Gassendi, he might have advanced the boundaries of physical as he did those of mental science; since his improvements of that author's philosophy evinced his competency for such a destination. Even Aristotle, if we may judge from the vastness of his genius, which enslaved the mental world for two thousand years, had he lived in other times and circumstances, might have anticipated the brilliant intellectual career of Leibnitz or Laplace.

And besides, it is obvious that the successful investigation of nature and its laws cannot be pursued without a corresponding expenditure of intellect and genius, which, but for such investigation, would have been devoted to other objects. Consequently, since inquirers now partake so largely (as we shewed) of the character of the spirit and feelings to whose influences they have been exposed, *they* will not only want ability them-

* See Somerville's *Mechanism, &c.* p. 148.

selves, but the *public* will have neither leisure nor taste to wander in “the moonlight and dimness of mind.” But when physical science has rendered the latter too busy, or too knowing to require the benefit or amusement which mental inquiry is calculated to bestow, none will attempt to give it them ; and all biography informs us, that men of great intellectual powers turn from pursuits that are not encouraged to those that are. Now all this is manifestly unfavourable to the progress of mental philosophy. For since large bodies move slowly, before the current of public thought can be diverted from the channel in which it now runs, the prospect has nearly become hopeless of the future progressive improvement of mind. In fact, the obstacles may be pronounced as now altogether insuperable, which it shall be necessary to remove, in order to establish the study of mental science upon an equal footing with that of physical, for general attention and regard. Much has to be unlearned, habits to be forgotten, and associations already grown familiar to be abandoned.

In general, then, it may be concluded, that as the pleasures derived from physical inquiry and its benefits to the useful arts, are necessarily in a given age proportioned to its successful study ;

and as both transmit a claim powerful, if not irresistible, for cultivation to subsequent periods ; so it is evident that the greater its progress becomes, the stronger will always be the feeling of respect with which it is regarded by the public ; and the less the chances of mental philosophy for being improved and advanced, in consequence of the limited number of minds which are now inevitably devoted to its pursuit.

It may be objected, perhaps, to this conclusion, that since *admiration*, the chief inducement to the public to pursue *any* science, is, according to a theory of Helvetius,* always the effect of the *surprise* produced among them by original discovery ; consequently the more that great men are multiplied in the domain of physical inquiry, the less will they be esteemed, and the less will be excited emulation to excel in departments of knowledge, which have already been overtaken by universal study : in other words, that mental philosophy will obtain negative means of continuance and progress, in consequence of natural research thus reaching a point at last, where will be developed the principles of its own extinction, so far at least as its

* *De l'Esprit*, disc. ii. c. 10.

vigour is considered to depend upon the *numbers* who apply themselves to its cultivation. But to this objection it may be replied, in terms equally general, that nothing operates (as by it we should be led to suppose) to its own deterioration or partial annihilation, which must ever be forced upon it by means external and hostile; and that till such means be specifically referred, in the present instance, to the action of mental science, we may justly allow to our argument the same value that it possessed in the absence of the consideration that we would thus nullify. But, moreover—

2. Our *second* observation is,—that before any such danger can overtake the superior claims which we have now ascribed to physical research over the philosophy of mind, for general cultivation and consequent progress, the former has previously arrived at an extent of perfection (if we may so speak) which cannot fail to ensure and perpetuate for it these advantages. Without bounds like nature herself, and having advanced indefinitely by the labours of successive generations, it is raised at last to a height from which it cannot again relapse. Thus, from the age of Euclid and Archimedes,

for example, to the completion of the Méchanique Céleste, the philosophers and mathematicians of all ages and countries had, in various proportions, been employed for one great end ; all co-operated in preparing a state of knowledge in which such a book could exist, and in which its merits could be appreciated. Works of genius in the natural sciences, therefore, may aptly be compared to those superb monuments of antiquity, which, though performed by several generations of kings, bear the name of him who finished them. It was neither, nor was it both of these astronomers, but only the labours of successive generations, that collected the materials, sharpened the tools, and constructed the engines, used in the great edifice, which Newton planned and Laplace executed. And when we look at physical researches projecting over so large a space as to coincide with almost all the intellectual occupations of mankind, however different in their objects, their method, or the qualities of mind which they require ; is not the conclusion irresistible that their principles, too, the character which they form, the knowledge which they impart, the extent of the theories which they include, their application to all the objects of nature, and to all the wants of society,

(afterwards to be noticed,) will spread at last over too large an expanse, and will influence the opinions of too great a number of enlightened men, ever to fall back from the present stage of their progress towards perfection? No future generation, it may safely be presumed, will have to invent, for a second time, the astronomy of Newton, or the mechanics of Watt.

But when physical science has thus arrived at a stage of perfection which secures it against danger from relapse, it now also begins to multiply and to meliorate its opportunities for yet greater degrees of progressive improvement; here reproducing discoveries which give birth, in their turn, to others that also efface, as it were, those from which they sprung; and that "open up to genius (as it has beautifully been expressed) that immense horizon on which, to the end of time, it may exercise its strength, and at every step behold the limits receding to a greater distance." Every individual becomes furnished at length with the united means which the efforts of all have created, and can proceed to new discoveries with increased chances of success. Though the extent and energy of the genius of *single* minds may ever remain the same, yet, by multiplying and improving the instruments now

employed, the genius of the *human race* will more than double its powers. The rills of its efforts, gathering from all quarters, and contributed to by all ages, become united at last in one general current, and proceed in a common and augmented stream. Their march is by multiplication and not by addition; in geometrical, not in arithmetical progression.

From this view of its attributes, so important and so striking, there has ever been claimed for physical science almost an exclusive tendency to improvement. This tendency is peculiarly manifest in the inventions of the moderns, in their knowledge of the sciences, and in the practice of those arts which have for their object the “endowment of man’s life with new commodities;” but most of all, perhaps, its nature and character have been conspicuous in what may be termed *double discoveries*. Thus, for example, we are told that the inventions of gunpowder and of printing were made once in China, and again in Europe; and we know that the doctrine of fluxions presented itself nearly at the same time to Newton and to Leibnitz; that Priestley and Scheele made also the same chemical discoveries, at the same time, in England and in Sweden; and that, even of late, some of the famous conclu-

sions of Malus, regarding polarization of light, were arrived at, by a different method, by our own Brewster,—each of them having been ignorant respectively of his contemporary's discovery.

With this irresistible tendency to advancement, which is so peculiarly characteristic of physical research, *chance* or *accident* will be seen powerfully to combine; the former possessing this advantage, to establish for itself another and a new claim over mental philosophy, for general study and further improvement. If accidental circumstances do not directly produce, they at least prepare the discoveries, and collect the truths by which inquirers may enlighten the empire of the sciences. Napier invented logarithms with a view to facilitate calculations in arithmetic; but means which he did not foresee, and over which certainly he had no control, afterwards evolved farther consequences from his discovery; and by new applications of it, developed branches of physical inquiry, that in his time had no existence. Over-ruled or guided by *chance*, that is, by causes beyond the notice or power of any human instrument, acquisitions, apparently the most trivial and useless, are often, in the domain of nature, made the necessary forerunners to im-

portant discoveries: and the labour now spent in a microscopic examination of objects, seemingly the most insignificant, may only be preparing the way for the achievements of some splendid genius, who will combine their minute details into a magnificent system, or evolve from a multitude of particulars, collected with painful toil, some general principle which, though now unsuspected, is yet destined to illumine the career of future ages.* Those who are well acquainted with the state of the natural sciences, will scarcely fail to observe that many of their branches, particularly chemistry and geology, even at present, are slowly but steadily converging to important results. The divine fire of physical discovery is running along the earth, prepared as its materials are properly disposed, to "emit a brighter ray."

But it must be mentioned, at the same time, that the advantages of comparative perfection, and of irresistible tendency to progressive improvement, which we have described as so peculiar to physical investigation, are also common,

* Bacon remarks, that it does not often happen to those who labour in the field of science, that the same person who sows the seed also reaps the harvest.

in a certain degree at least, to mental philosophy. The very view of such attributes in the former, only stimulates the students of the latter to fresh ardour of inquiry, with hopes of attaining to similar results in their own favourite walk of inquiry. *Its* phenomena, accordingly, begin to be more strictly examined ; they pass into a body of accredited science, and applications are made of them to all the speculative and moral purposes of life. Attention is paid to their latent connexions and dependencies ; and all hitherto unnoticed relations which such increased vigour of reflection enables us to perceive, form a new and important addition to our intellectual knowledge. But constant or increased reflection on the part of its students, is the essential requisite (as we formerly observed) for the successful prosecution of mental philosophy ; and if this reflection be the happy result of the attributes in physics which we are describing, much has consequently been effected by them already, for giving to the science of mind that character of comparative perfection, and of irresistible tendency to progressive improvement, which has now been assigned to themselves. Bacon, it is worthy of notice as illustrative of these remarks, was a contemporary of Galileo ;

and by the depth and importance of his speculations with regard to mind, may be said mainly to have prepared the way for Locke, Hume, Smith, and a multitude of others, who rendered the mental world familiar with truths which, however demonstrable at all times, certainly had never till then entered into the conceptions of its occupants.

But as still farther illustrative of the irresistible claims of physical science for necessary progress, and of its superior character in this respect to the philosophy of mind, it may be safely affirmed, after all, perhaps, that the counteracting influences of the latter, which we have now been reviewing, not only do not lay any positive arrest upon the former's advances, but merely obtain, in virtue of the simultaneous progress of *all* branches of knowledge required by it for its own free cultivation. Even in respect to the influences which have lately been quoted, we may observe that although, as it was stated, such men as Bacon, Locke, Hume, Smith, and others, appeared in brilliant succession during a period of splendid improvement in physical research; yet it is doubtful how far many of their most important contributions to mental philosophy were owing entirely to the necessity of

attention to the latter, for illustrating their more favourite subject of politics. Politics, indeed, are just a sort of physical science; and their study, equally with it, has a direct reference to the melioration of society, and of the outward accommodations of life. In the period, accordingly, of Hume and Smith, that is, in an age where the science of politics was mainly attended to, and when all others were, in a manner, subordinated to it, we find that Montesquieu and Malthus lived; all equally with the physical inquirers of the time, and in obedience to the will of Bacon, the natural pioneers of civilization, and of "the enlargement of the bounds of human empire to the effecting all things possible." Men had already been taught to revere, and excited to pursue science, in consequence of the splendid proofs which it had given of its beneficial power; and thus it is impossible, as we said, to determine how far the necessary progress which has, upon these grounds, been ascribed to mental philosophy, was owing to any inherent principle of improvement in itself, or merely to its subservience to the advancement of physical investigation.

And these views of the relative claims of physical and of mental science, for successful culti-

vation and permanent progress, are still farther confirmed and illustrated by

3. Our *third* observation ; which is, that the multiplication of discoveries, and the advancement of physical science beyond the power of minds to elucidate or improve, who may be inferior to those by whom these results have been produced, and thus, on the one hand, its liability to be deprived of the advantage of numbers in regard to its study, and on the other, to be suspended in its progress to perfection ; all this, we say, is avoided in physical science by the *subdivision* which it now generally, if not necessarily, undergoes. The road to natural knowledge, if not a royal one, can be greatly shortened, however, because they who press forward are many ; and we can accelerate our advances by allotting to every man his mile of the march. This, indeed, is a positive claim which physics possess for confirming and extending the benefits which, in our two previous *observations*, we have assigned them ; for if it do not *of itself* advance their boundaries, it at least secures for them the operation of numbers in their behalf, to apply to their study, and consequently, of opportunities likewise for necessary and pro-

gressive improvement, and of still nearer approaches than before to perfection.

In respect, then, to the effects of such subdivision as we have mentioned, upon the claim to *numbers* who will attend to its pursuit, which we ascribed to physical research, it may in the first place be remarked, that should any one favourite department of it be already occupied, that is, want sufficient inducement for others to apply to its cultivation, inquirers in so wide a field will more readily have recourse to cognate or congenial branches of study which this indefinite subdivision may yet have left open for them, than betake themselves to mental science, in regard to which they have little sympathy or delight. The distance, consequently, between physics and the philosophy of mind, and the impossibility of any reaction by the latter, will augment in proportion to the subdivision which the former undergoes; the natural inquirer being less apt, when more subjects are now offered for his selection than before,—to betake himself himself to mental pursuits, than he would have been, if all the posts had been occupied in his favourite study.

And respecting the effects of subdivision in physical science, upon the second great advan-

tage which we assigned to mental philosophy—arising from its *extensive compass* and *inevitable tendency to improvement*, we may next observe, that, since the different departments of the former exhibit, even at present, all gradations of growth from infancy to maturity, the arrangement of them according to their degrees of development will ever afford useful employment for intellectual labour ; and the exact terminology imposed will also accelerate, in no mean degree, their destined perfection. This, then, is an era of most auspicious consequences to physical research ; not the less so, that those who measure its progressive improvement merely by the number or the splendour of its new discoveries, more than by the security which is gained for its present possessions, may detect in it only deficiency of genius, or an incapacity in the public for the successful investigation of science. But the precise phraseology which is imposed in the way that we allude to, is to be regarded, on the contrary, as a powerful engine of advancement to natural inquiry. The discoveries and exertions of one age, being incorporated in the language of their respective sciences, become inevitably subservient and directly conducive to their progress in another.

Though our modern sciences, indeed, have now been almost twenty-five centuries in growth; yet it is only during the last five of these centuries, when a medium of expression adapted to their nature and exempt from former ambiguity and fluctuation, has been obtained, that they have made any solid or permanent improvement. In chemistry, for instance, what improvement is implied in its present terminology; and what important results are manifestly indicated by that which seems to be inevitably approaching!

With the advantages that have thus been attributed to the effects of subdivision, in regard to natural science, *learned societies*, we may add, peculiarly combine; if they are not the necessary result, indeed, of this subdivision. For since it is essential to the nature of these societies, that they consist of individuals eminent for their attainments in physical researches, and as it must ever be an object of ambition, of course, to be admitted into their number, so an important impulse, consequently, is imparted to the progress of natural knowledge; because they will, in general, both contain in their bosoms the fittest members in the community for advancing the landmarks of science, and it

will be their inherent and incessant tendency, likewise, to exercise the student's invention,—to arouse his curiosity, and awaken in him the spirit of active inquiry.* It is obvious, indeed, that the collision of minds, thus effected, is especially beneficial to the development of faculties in each individual ; particularly if these minds are bent, as at present, on distinct yet kindred intellectual pursuits : in other words, that the several branches of physical research will also, in this manner, be improved, at the same time that they are extended and multiplied.

But the effects of learned associations for the advancement of science, when commensurate with the whole field of physical inquiry, as from the nature of the latter they seem destined to become, may be regarded as productive, if possible, of still greater benefit in regard to its cultivation and progress. As the whole of the natural sciences are closely connected, and mutually illustrate one another, it will, therefore, be the object of these associations to bring all those personally together who are labourers in the same wide domain of inquiry ; to procure the mutual interchange of opinions, whether pre-

* See Mr. Babbage's *Decline of Science in England*, p. 28 ; also *Appendix, Note G.*

senting themselves as discoveries or doubts ; and thus to combine with the great end of our modern and improved science, namely, to increase indefinitely that common fund of intelligence which mankind acquire from correspondence with their fellows ; and to draw close between all nations the bonds of brotherhood, connecting them by commerce, or endearing them by the spirit of benevolent enterprise. It is, indeed, the peculiar and acknowledged advantage of learned societies, that with the natural tendencies of physical inquiry, they combine very essentially to diffuse over the earth the blessings of refinement and of social intercourse. "They are the foundation," says Humboldt, "of brotherly intercourse in science, and while they throw light on it, they add cheerfulness to life, and give patience and amenity to the manners"** "They cultivate, (observes a living statesman,) along with the powers of the understanding, the best feelings of the heart ; they soothe down national prejudices ; they link still closer together the philosophers of all countries ; and while different governments continue to foster and encourage their exertions, who are of no party,

* Journal of Science for April, 1829.

and over whom the angry tempests of war pass innocuous, they will take the best means to procure peace on earth and good-will among men." "Therefore," says Arago, "I trust that the great nations—France and England—will never become rivals again, except in emulating, by feats of science, which of the two shall most conduce to the comforts and happiness of the human race." *

These effects of civilization, as produced by physical research, upon the pursuit and progress, if not also upon the nature and character of the philosophy of mind, we shall presently have occasion to examine more particularly ; but, meanwhile, we shall sum up the argument which has already been afforded us in regard to the superior claims of the former for general cultivation ; and of its consequent influence in retarding, or even in arresting the advancement of the latter.

Our argument, then, is, that there is something very peculiarly gratifying in the study of physical science, especially in its discoveries, and possessing attractions so superior to any which

* Jameson's Journal, vol. xvii. ; containing Speeches of the Lord Chancellor, Arago, &c.

arise from the pursuit of mind, that the inquirer will generally find more powerful inducements to cultivate the former than the latter, and be affected with more real satisfaction in the progress which he makes. The interest belonging to natural investigation extends to all,—that of mental science only to a few, because only to reflective and inquisitive observers. Such claims for cultivation, moreover, the utility and other attributes of physical inquiry, which were noticed, will ever secure it from danger of losing; and the subdivision which ensues of its different departments, will never leave the field of scientific investigation barren of interest to those who pursue it merely for its own sake, and not for the ends which it is found to subserve. Not that the philosophy of mind, indeed, will not advance claims for cultivation, or make progress during the absence of any thing to dazzle or to astonish in its rival; on the contrary, it may prosper, we shall allow, in such intervals, and even gain an ascendant, by which all adverse influences to its vigorous prosecution shall, for a time at least, be partially checked or successfully repelled. All this is freely conceded. But it seems equally clear, notwithstanding, that while in the kingdom of nature there may be

nothing, for a period, to attract or to amaze, nor any thing, consequently, to injure the pursuit of mental philosophy, yet the former will, meanwhile, insensibly multiply her provinces; and thus, by presenting constant and more enlarged spheres for influence, tend finally (it should seem) to arrest the career of the latter; so that the study of mind may vanish, as it were, if not amidst the brilliant and transient flashes of natural discovery, at least in that gentle and more tempered sunshine, perhaps, whose effects will be the more permanent and extensive, that its origin was slow, and its sway unsuspected.

But while these *negative* effects (if we may so speak) by natural, upon the pursuit and progress of mental research, have been freely admitted, the question may still remain, How far will the former, in consequence of the aid which it lends to civilization, and by influences entirely beneficial, co-operate, after all, to the advancement and cultivation of the philosophy of mind; whose sphere, we may observe, is less extensive, and for whose successful prosecution that refinement and virtue are so congenial, which it has generally been allowed to be the tendency of physical inquiry to produce? With

the enlargement of reason by natural pursuits, Bacon always combined the growth of virtue; for he thought that “ truth and goodness were one, differing but as the seal from the print ; for truth printed goodness.”* “ History,” observes Bruce, in the same sense, “ affords but few examples of philosophers who have made discoveries ; and who have, at the same time, separated the pleasures of the understanding from those of morality.”† It is, indeed, the honourable boast of the extent to which the knowledge of the laws of nature has already attained, that it has dispelled those errors and delusions, and those systems of superstition which formerly disgraced the world, and which were owing, no doubt, to ignorance respecting these laws. We shall allow, too, that by securing men, in so eminent a degree, against imposture and the prejudices of their age, and against blind confidence in those whom they entrust with their rights, and by thus inspiring them with a sense of duty, and with the power of discharging it, the advancement of natural science necessarily and for ever removes the obstacles which the pride of bigotry would erect against truth and freedom of discussion ; that

* *Augment. Scient. lib. i.*

† *Ethics*, p. 258.

it breaks down the barriers which the despots of the earth might oppose to the august inheritance of knowledge ; that it diminishes the number of spaces which the globe as yet contains inaccessible to refinement and social happiness ; that it hastens the period when the sun in his course shall illumine free nations only, who are the subjects of no other master than reason ; that it withdraws those maxims which press heavy upon the human faculties, imposing such alone as favour their action and energies ; and that it loosens the shackles which depress the liberty of improvement, or of industry ; thus giving full and unfettered evolution to the highest powers of the understanding, and the noblest sensibilities of the heart. While, in a word, the progress and cultivation of physical research have rendered triumphant our power over the world which we inhabit ; when we can give laws to the elements of nature, and circumscribe their empire,—put to flight both time and space by the rapidity of our engines,—and thus hold daily intercourse, as it were, with the most distant regions of the earth ; when civilization, we say, has been rendered universal by attention to natural inquiry, and those enjoyments or social accommodations perfected, which are so favour-

able to our conduct and capacities, as reasonable and moral beings, is there not every reason to conclude, that the study of mind, instead of being *now* neglected or despised, will rather be superseded by the better practices and duties which it imposes ; and that “ the mistress of human life,” if destined to quit the scene, will only retire at length—like an aged matron, proud in the strength, the virtue, and the beauty of her offspring ?

Such is the reasoning and fervid representations, often employed* by the sanguine admirers of physical science, and by those who entertain high and virtuous anticipations regarding the final and lasting supremacy of reason. But our preceding remarks on the influence which such results as these, by natural inquiry, will exercise upon the cultivation and advancement of mental philosophy, are only confirmed and not impaired by the prospect which this very survey presents to us. For, while the knowledge and the power of man over inanimate nature, have been increased tenfold in the course of the last few centuries ; the knowledge and power of man, however, over the mind of man, may be

* Writings of Condorcet, *passim* ; quotations from them, and comments in the Works of Stewart, &c.

said to have obtained almost no advance since the first development of his powers. A real and surprising progress, indeed, has been made in exploring and subduing the physical elements of nature; but the philosophy of mind exhibits only few trophies of *her* achievements in bending to her power the more pliant and susceptible elements of human genius and character. In the natural world, the human intellect has built up an edifice of knowledge of which the former ages of mankind had formed no imagination, and has there put forth its energies with unprecedented and astonishing power; although, in the extent of its acquaintance with its own nature and operations, it may reasonably be questioned, nevertheless, if it ranks far above, or even stands upon a level with many of those which have preceded it.*

But while these are the effects which, negatively as we mentioned, physical research is calculated to exert upon the pursuit and pro-

* It is true, indeed, that *education*, for instance, has made astonishing progress of late, and by means, perhaps, of the great and rapid advancement of physical science; but it remains to be seen, that *that* improved education does not imply a corresponding extent of acquaintance with mental philosophy, but rather the reverse.

gress of mental science, in virtue of superior claims which the former possesses for cultivation ; there are also influences more *positive* or *direct*, which, when carried to the extent at which we are now reviewing it, will be imparted by it, at the same time, to the nature and character of the latter. And with the specification of one or two of the more palpable and important of these influences, we shall bring to a close our present observations.

The most astonishing effects of physical science, in the stages at which we have just now reviewed it, were its contributions to civilization, or the accommodations of life. What we wish *first* to observe, then, is, that social refinement not only enfeebles the inherent vigour of the mind, (and, consequently, also depraves through this imperfect medium the nature of mental science,) by reflecting back upon the soul that indolent softness which it receives from it ; but that in the scope, too, which is now afforded for political activity and contention, it opens up, at the same time, constant scenes for anxiety and interested feelings, thus inducing a temper the most unfavourable of any to contemplative philosophy. Literature, indeed, may be embraced as a sub-

ject of occupation or amusement, during the intervals that remain amid such contention and anxiety ; and thus at once call into play the powers of the mind, and rescue their study from that oblivion which otherwise they might have shared. Of literature, it is indeed the acknowledged tendency to allure inquirers into the neighbourhood of intellectual and of moral cultivation ; to extract mental disquisitions from scholastic seclusion ; and to give them a root in the general esteem. But this effect is apt only to be temporary. For since, at most, literary studies were pursued at first only in subservience to political or social engagements, or as a mean to a more important end, it is not likely that they will afterwards come to be valued above the purposes for which they were thus rendered conducive, or to be cultivated to an extent sufficient to realise any beneficial consequences to the advancement or the character of mental science. In a word, literature will not be attended to, in such intervals, till it propose the faculties and affections of the mind as objects of distinct and of paramount regard ; or till it lead men to compare the extensive reach and high character of their powers, with the facilities which human life affords for their exercise ; of which

powers nothing more is required than a clear perception of the importance, (obtained in this manner,) in order to render their study at once interesting and general. It seems to follow, therefore, that in respect to mental science, whether in its pursuit or in its nature, the advantages of civilization as induced by physical researches, and as inspiring the love of literary studies, since these do not necessarily beget a devoted attention to mind among the people where they exist, exercise upon the latter, notwithstanding, the same prejudicial effects as the cultivation of subjects allied to, or part of natural inquiry itself.

Besides—and in modification of some of the advantages that have been ascribed to physics—we may observe, that the extreme attention which, in an age of scientific investigation, is expended upon the latter, gives rise to *two* important results, equally injurious to mental science, whether in respect to its pursuit or its character. They are prejudicial both in an *intellectual* and in a *moral* point of view.

1. As we remarked before, the numberless subdivisions of labour which we witness in every department of inquiry, are owing to the progress which pursuits in physical science have made,

and to the great attention which is devoted to them. Now, that the concentration of individual power on each part of scientific research, tends to its improvement, in consequence of the division of mental labour, it is needless to observe ; but it is equally obvious that such separation of work, and exclusive study of the objects in regard to which it takes place, have a tendency unfavourable to strength and energy of mind. As the sphere of labour in which the individual is employed becomes narrower, the greater skill, no doubt, will be required in the performance of his part ; but his intellect, at the same time, becomes proportionately contracted. Even in a state of society where science is yet rude and elemental, the student, if devoted to its pursuit, has to turn attention from object to object, and thus acquires, by the very exertion of thought upon a multiplicity of things, where the subdivision of mental labour, to any considerable extent, is unknown—an energy of intellect that would have been wanting, had his mind been limited to *one* department of knowledge. What he now gains in nicety and accuracy of tact, he loses in copiousness of ideas and comprehensiveness of views ; and thus it would almost appear as if in the mental, like the civil world, the perfection of individual cha-

racter must be sacrificed to the general progress of society. Our humblest mechanic now-a-days can wield, with the utmost readiness and familiarity, the mechanical apparatus of Archimedes or of Newton; yet, in respect of intellectual ability or real knowledge, he stands centuries behind those great pioneers of science and civilization. But were the mind, on the other hand, more steadily turned in upon the consideration of its own powers, the vast and extensive reach of their capacities, and their high destiny; in other words, were its attention more equally divided between physical and mental science, the beneficial result should then be realized for the latter in modern times, which Socrates accomplished of old by bringing down philosophy from the heavens to dwell with men; and this, perhaps, even in our enlightened age, would be the first step to true wisdom.

2. But, that the earnest attention which at present is, and which will always be, devoted to scientific pursuits in an age when their progress is so considerable, is detrimental to the mind, and, therefore, to its inquirers also in a moral point of view, a very few words may suffice to shew. Where the intellect is limited to *one* department of mental labour, it becomes narrower, as we said, loses its energy, and is

disqualified in consequence for excursions beyond its own confined sphere. Instead of "spurning in its own native immensity," as it has eloquently been expressed, "the laws and conditions of this transitory life," it is diverted, by such division of mental labour, out of its natural course; and, in the language of a philosophical poet, is made

An offering,—a passive thing employed
As a brute mean, without acknowledgment
Of common right or intent in the end :—
Though not for these sad issues—
Was mind created; but to obey the law
Of life, of hope, and action.

While such purposes are violated, then, a materialism contracts around the soul, resulting in consequence of the objects about which it is employed being palpable and visible; and which when predicated of the mental philosopher, is merely synonymous with incapacity for sound investigation. Hence, when turning to morals or to religion, which are impalpable and invisible, and wanting *substance* (if we may so express it,) he naturally feels a sort of uncongeniality with them, and is tempted, it may be, to question their possession of any *reality of*

truth at all. A tendency to atheism, therefore, necessarily connects itself in the mind of an inquirer like the present, with these causes as shortly explained, which should, in a great measure, be removed, however, were his thoughts more habitually conversant with objects not possessing this tendency ; that is, with mental philosophy, as well as with physical or material researches.

The conclusion from these remarks, then, is plain and inevitable with respect to our subject ; *first*, that those inquirers whose vigour of understanding has been impaired by long or intense application to physical science, will naturally be more apt to maintain attention to the latter, since, on account of the division of intellectual labour which it produces, it can never fail to afford them spheres of occupation congenial and well suited to their narrow powers and existing habits of thought, than to betake themselves to mental philosophy, which is less susceptible of such division, or of the advantages to its own study arising therefrom ; that, in the *second* place, the diminution of intellect, and the incapacity for sound investigation, which are so unfortunately contracted by habitual devotion to material pursuits, are themselves the very negation

of that postulate which we have already seen to be essential for success in mental researches,—namely, the unfettered expansion and operation of all the faculties of the soul ; and, *lastly*, that the longer attention continues, under these circumstances, to be paid to the former, the more detrimental will be the consequences necessarily entailed upon the latter.

Nor, while such must be conceded as very generally the influences which, with all due allowance for the checks that from time to time they may receive, physical investigation is calculated to exercise over the character and the cultivation of mental philosophy, do we mean to deny that the nature of the former may frequently admit, or that even the history of science does furnish the names of many whose intellects were illumined and invigorated by their natural inquiries, and who amidst *these* succeeded in maintaining their energies unimpaired, and in displaying their competency for the successful pursuit of mind. Many remarks and instances, on the contrary, have been made, all perfectly sufficient for a conclusion like this ; we only affirm (for these are so rare, after all, as to strengthen instead of weakening the suspicion) that intellect, when occupied in phy-

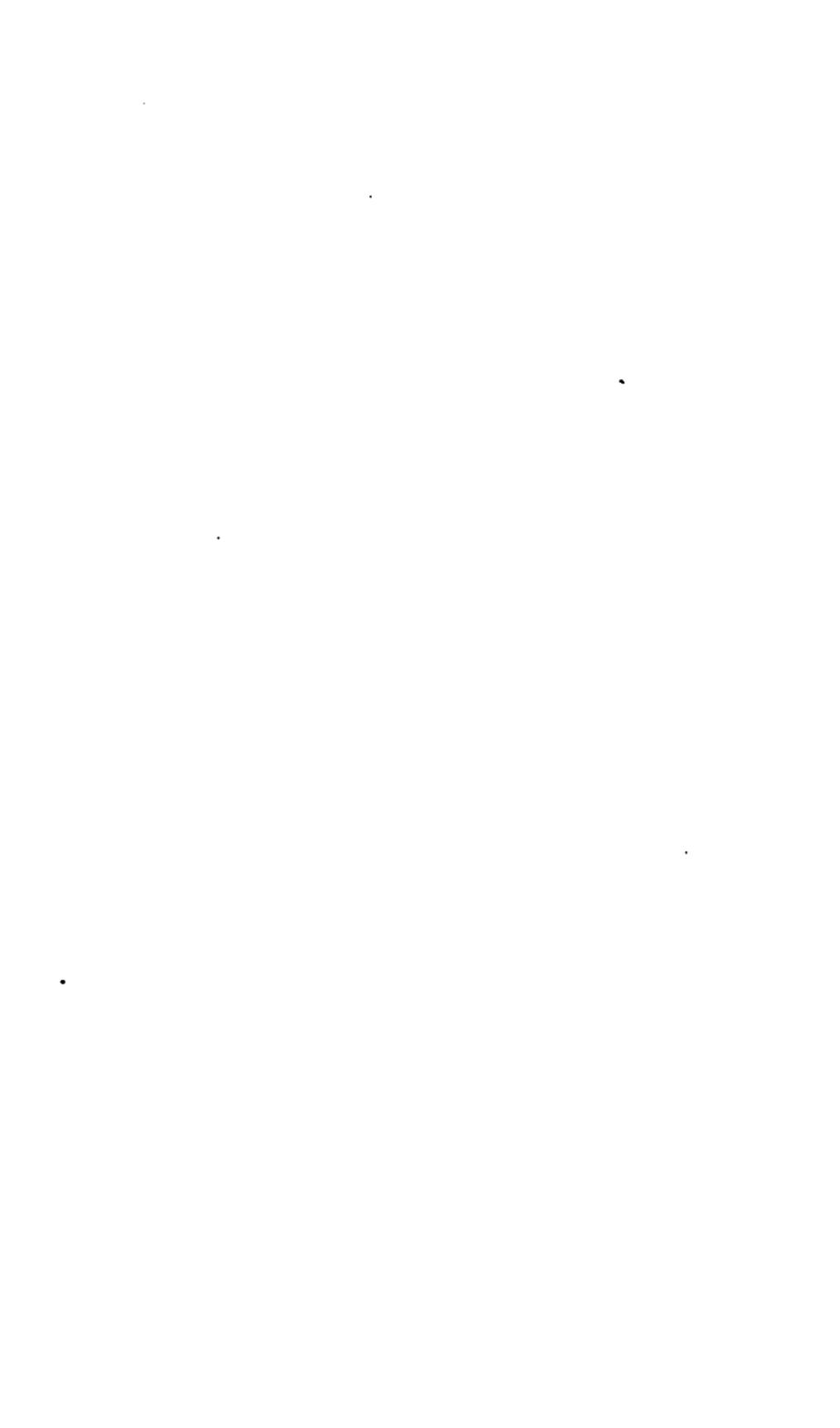
sical inquiries, is apt at once to be perverted thereby, and to exclude the philosophy of mind from the attention and thoughts. It is, indeed, the obvious and acknowledged tendency of mind, on the one hand, to carry away into a new and a distinct field of inquiry from its own, the character and habits which it had assumed in the old ; and its constitution, on the other, renders it difficult for it to contemplate with due success its own truths and feelings, in connection, at the same time, with the objects of external nature.

These reasons and remarks, therefore, viewed in connexion with the general scope of the preceding, seem fully to warrant us in concluding upon the whole, that since the study and advancement of physical inquiry are subversive of those conditions which mental philosophy requires for its successful prosecution, they are necessarily prejudicial, at the same time, both to its nature and character, and also to its cultivation and progress.

Still, from all that has been stated, we repeat that (in the language of an author who was eminently qualified to decide upon such matters, nor the less so because his prejudices were

all against the favourable character of the influences in question) there may likewise be much reason for allowing, that “we ought never to despair of human genius, but rather to hope that, *in time*, it may produce a system of the powers and operations of the mental world, no less certain than those of optics or astronomy ;” and for believing that, “although the philosophy of body be elder sister to that of mind, yet the latter hath the principle of life no less than the former, and will grow up, though slowly, to maturity.” *

* Reid’s Essays ; Preface.



APPENDIX.

NOTE A, page 8.

The comparison alluded to, occurs in Madame de Staél's *Allemagne*, i. c. 18. It is here also worthy of remark, that the same "evil results" and objections which she ascribes so justly to devoted attention to mathematics, are not *obviated*, but only *accounted* for, by Mr. Whewell. "They arise," he observes, "either from the student pursuing too exclusively one particular branch of mathematical study, or from erroneous notions of the nature of demonstration."—*Mechanical Euclid*, pp. 149, 150. Of course, the question, at present, is with the injurious tendencies of demonstrative science in regard to the mental student *in general*, not with the possibility of such tendencies to be counteracted in the hands of *certain* inquirers.

NOTE B, page 11.

"Scepticism," says Dr. Arnold, "must ever be a *misfortune* or a *defect*; a misfortune, if there be no means

of arriving at the truth ; a defect, if, while there exist such means, we are unable or unwilling to use them."—*Roman History*, Preface. The same remark may be applied, *mutatis mutandis*, to credulity.

NOTE C, page 18.

The quotation in the Essay is from the *Observations upon Religio Medici*, by Sir Kenelm Digby, (p. 6;) where the passage from Bacon occurs. It is remarkable, however, that though he adduces the idea with approbation, and intends it to illustrate his views, yet Sir Kenelm's own work, *De Immortalitate Animarum*, is one of the most decided instances of the frequency, in the history both of physical and of mental science, with which correct *theories* are seen to anticipate their just and appropriate *application*.

NOTE D, page 26.

Mr. Hume, for example, in explanation of the object of his Treatise, observes that the application of experimental philosophy (just modes of research) to metaphysics, came after the application of the same to physics, at the distance of about a whole century ; that interval having also obtained between Thales and Socrates, and between Bacon and those mental philosophers, who, in this country, are said to have put the science of man upon a new footing.

NOTE E, page 61.

In an Epistle to the Reader, in Hobbes' *Human Nature*, we are informed by the Bishop of Sarum, (who wrote it,) that "the Author had composed a body of philosophy upon such principles, and in such an order, as are used by men conversant in demonstration ;" and in the Epistle Dedicatory, Hobbes himself assures us, that "to deduce the doctrine of justice and policy to the rules and infallibility of reason, there is no way but first to put such principles down for a foundation, (meaning mathematical principles,) as passion not distrusting may not seek to displace ; and afterwards to build them thereon by degrees, till the whole have been inexpugnable."

NOTE F, page 82.

It may be noticed, in illustration of the different esteem in which science is held in France and in England, owing, we apprehend, entirely to the injurious influences which the mercantile superiority of the latter has exercised upon her taste in this respect, that "on the occasion (to quote the mention of a remarkable circumstance made by Mr. Babbage) of his Majesty's speech at the commencement of the session of 1830, the *Gazette de France* stated, that the address was moved by 'Duc de Buccleugh, *chef de la maison de Walter Scott* ;' while if an English editor had related the fact, he would undoubtedly have employed the term *wealthy*, or some other of the epithets characteristic of that qua-

lity among his countrymen."—*Decline of Science in England*, p. 34.

NOTE G, page 99.

Such associations as are noticed in the *Essay*, are not likely to obtain in regard to mental philosophy, at least to an extent which shall place them on a level in that respect with physical research. The reason is obvious. In the first place, the general esteem or sympathy is mainly essential to the existence of these associations; and since natural studies have more powerful claims than mental for that esteem or sympathy, they will more easily and frequently obtain with respect to the former than the latter. Again, physical science seems divisible into departments more numerous, and more distinct and independent of each other than mental; consequently, even although to the latter there *should* be attributed the advantages of learned societies for their cultivation, yet a sort of violence will thus be done notwithstanding to its nature, and therefore also to its conditions of successful prosecution. As farther illustrative of this remark, no apology seems necessary for appending the following quotation from the *Physical Theory of Another Life*, which appears to us highly distinguished by the soundness of the views it contains: "The habit of simple and single intellectual action, (it is observed in pp. 88, 89,) soon fixes itself in a definite form, and men become mathematicians, logicians, experimenters, poets, artists, moralists; and thus learn to entertain every object of thought in a technical manner. Hence result those partial apprehensions of general truth, which limit the ad-

vancement of each mind within narrow bounds ; and hence too, comes that division of labour in the world of mind, which, although productive of advantage upon the whole, and in relation to ordinary pursuits, and to some of the secular sciences, yet bars the advancement of philosophy in its wider range, and is peculiarly disadvantageous in its bearing upon the elevated themes of theology, which, because they are in the most absolute sense universal, are not to be apprehended by any *single* faculty of the mind, but stand in such a manner related to our *entire* intellectual and moral constitution, as that it is only when *every* faculty in harmonious and simultaneous exercise is actively engaged upon them, that they can be really embraced. The metaphysician, let his analysis of abstract notions be as exact as it may, still misapprehends the Divine nature, inasmuch as the analytic habit of his mind, and his peculiar mental conformation, tend to exclude or to abate the moral and the concepitive faculties ; it is, therefore, only *one* set of relations which he discerns ; and so the poet, and even the man of acute moral perception, alike misapprehend the Supreme excellence. On this high and arduous ground we fail, not merely because the infinite transcends the finite, but also because, by inveterate habit, we go on to divide, and to distribute, and classify that, the very essence of which is, that it is indivisible and *one*."

It is obviously deducible from the general tenor of this extract, that while physical research is cultivated with advantage by the subdivision which obtains with regard to it, the study of mental science is injured thereby ; and also that the successful prosecution of the

former may be independent, in a great measure, of the full expansion of all the faculties of the mind ; while, for the advantageous pursuit of the latter, the very contrary is the indispensable condition.

THE END.

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